HYDRAULIC PRESS BRAKE

COMPANY NAME:

MACHINE TYPE: AD-R 25100

SERIAL NUMBER: 7312126951

PURCHASE NUMBER:

DATE:

HYDRAULIC PRESS BRAKE
AD-R SERIES

INDEX **PAGE**

- Index 2
- Foreword 5
- EC Declaration of conformity

CHAPTER 1 – GENERAL SAFETY WARNINGS

1.1 Safety Instructions 7
1.2 Unavoidable Risks 8

CHAPTER 2 – GENERAL DESCRIPTION OF THE MACHINE

2.1 Introduction of the Machine 9
2.1.1 Machine operation principles 10
2.2 Warning and introduction labels on the machine 11
2.3 Prohibited applications 19
2.4 Safety switches and guards on the machine 20
2.5 Light barrier safety calculation 24
2.6 Protective side cage dimensions 26
2.7 Safety areas on the machine 27
2.8 Technical data of the machine 28
2.9 Standard and optional accessories of the machine 29
2.9.1 Standard accessories 29
2.9.2 Optional accessories 29
2.10 Noise 30
2.10.1 Noise level measurements 31
2.11 Standards used in the design of press brakes 31

CHAPTER 3 - INSTRUCTIONS ABOUT THE TRANSPORTATION OF MACHINE

3.1 Delivery of the machine 33
3.2 Transportatıon of the machine 33
3.3 Removal of the package 35

CHAPTER 4 – STORAGE CONDITIONS 35

CHAPTER 5 – MACHINE INSTALLATION INSTRUCTIONS

5.1 General information 36
5.2 The workıng area of the machine 36
5.3 Machine Installation 37
5.4 Electrical Connections 37

5.4.1 Motor direction 37
5.4.2 Motor power specifications 38
5.5 Lubricant Information 39
5.5.1 Hydraulic lubricant selection 39
5.5.2 Grease Lubricant selection for lower-upper sledge 39

CHAPTER 6 – THE INSTRUCTIONS FOR COMMISSIONING THE MACHINE

6.1 Lateral and frontal protection cover assembly 40

CHAPTER 7 – INSTRUCTIONS FOR USE

7.1 Bending Information 42
7.1.1 Bending in air and with tool 42
7.1.2 According to Dehler chart 43
7.1.3 Die pressing 44
7.1.4 Back spring property 46
7.1.5 Bending diagram 48
7.1.6 Important notice for bendings 49
7.2 Operating the machine 50
7.2.1 Delem DA51-V4000-2 Station 50
7.2.2 Modeva 880S-pedal 51
7.2.3 Delem DA56-pedal 52
7.2.4 Modeva 880S-lasersafe-pedal 53
7.2.5 Delem DA56-lasersafe-pedal 54
7.2.6 Cybelec DU6000-Lasersafe-pedal 55
7.2.7 DNC 880s-C4000-pedal 56
7.2.8 Turning off the machine 56

CHAPTER 8 – MAINTENANCE, REPAIRMENT AND CLEANING INSTRUCTIONS

8.1 Safety in the lower and upper mold adjustment 57
8.2 Lower and upper mold adjustment 58
8.3 Back Gauge adjustment 59
8.3.1 Back Gauge adjustment (X.R optional) 60
8.3.2 Gauge finger adjustment 60
8.3.3 R Axis adjustment 61
8.3.4 X Axis adjustment 61
8.4 Y1-Y2 connection control 62
8.5 Hydraulic compression system 63
8.6 Maintenance information 65
8.7 Information about the lubricant used in the reductors 66
8.8 Machine lubrication scheme 67
8.9 Hydraulic reservoir lubricant level display 68
8.10 Rear light curtain test 69

CHAPTER 9 – TROUBLESHOOTING INFORMATION

9.1 Possible failures 69
9.2 Adjustment of the y1 and y2 axes in the CNC press brake with Cybelec DNC unit 71
9.3 Adjustment of the y1 and y2 axes in the CNC press brake with Delem da 66 unit 72
9.4 Crowning system 73

CHAPTER 10 – THE HEALTH AND THE SAFETY OF THE OPERATOR

10.1 The specifications of the hydraulic lubricant used 74
10.2 The recommended first aid 75

CHAPTER 11 – DISMANTLING / DECOMMISSIONING THE MACHINE

77

APPENDIX

- Foundation plan
- Hydraulic circuit schema
- Spare part list
- Electric schemas and auxiliary documents
- Guarantee certificate

FOREWORD

This user manual is prepared for our clients by also including the necessary technical data, in order to let our machines serve more efficiently and actively.

Our first principle is to obtain maximum performance in particular operations of the machine, which is produced with high quality materials, state-of-the-art technology and high level engineering services.

Our low operation-cost products would serve for long years, if you give importance to their regular maintenance.

While the press brakes, which exist in our product range, are being used for twisting sheet metals with various thicknesses and qualities, shears are being used for shearing materials (sheet metal, Al, Cu, plastic, paper etc.) with appropriate thicknesses.

Just like you, who are responsible for operating, the stuff working with the machine should also read this book at least once. It is essential to keep the book in the vicinity of the machine, in order to avoid possible defects.

Our factory possesses the right to implement recently developed technologies, without getting permission from any authority.

Along our service period since 1956, our domestic market position showed an increase especially in the last 30 years, namely since the expansion of the foreign markets. Therefore, the experience and technological advancements obtained from this market are being ideally reflected to our clients.

We wish you good luck with your machine and success with your business.

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CHAPTER 1 – GENERAL SAFETY WARNINGS

1.1 – SAFETY INSTRUCTIONS

By all means, read the user manual before operating the machine. Please contact the producer company if you have any questions concerning the machine.

1 – While the machine is being supplied, regard the given values on the instruction label situated on the machine.

2 - ! NEVER put your fingers, hands or any part of the body into the tool section or any moving part of the machine.

3 - ! ALWAYS be sure that the machine is **turned off**, before any service or maintenance operation.

4 –Do not allow anyone to perform maintenance operation, except the authorized personnel.

5 – Do not wear long, wide or large clothes for avoiding the possibility of the cloth being caught by the moving parts.

6 – Provide the grounding of the machine with copper grounding cables.

7 – The machine is designed to be operated with one (1) operator.

8 – Never open the rear cover and protective side covers while the machine is running.

9 – For safety, do no change the adjustment of the hydraulic valves.

10 – Do not change the position of the limit switches.

11 – Never exceed the maximum pressure value that is given on the pressure label.

12 – Both cylinders are sealed by means of a cover for preventing any possible squeezing of hands from sides and front. Therefore, never work while the cover is opened.

13 – An emergency stop button is placed on the pedal and the bench, for the safety of machine and the operator. Emergency stop button stops all dangerous actions.

14 – Illumination is realized at the necessary parts of the machine. The operating environment of machine should also be well illuminated and the workspace should not contain any obstacles.

15 – Any third person should be kept away from workspace.

16 – Tool rotating operations should be realized with chain.

17 – Press brake toolss are being produced with special production techniques. Always the use of original tools in the machine is recommended. Other tools may cause damage on the machine.

18 – Keep the workspace organized. Unorganized workspace causes error and danger and also limits your movements.

19 – Before using the machine, check if the safety equipment can fulfill their functions or not.

20 – Do not try to open the electric panel while machine is running. Shut down the machine's power before opening the electric panel.

21 – The operator must be work with steel-front footwear, for preventing a crash caused from a fallen work piece.

22 – Operator must be work with protective personal equipment. (gloves, shoes etc.)

23 – Use protective eyewear while working on the machine.

1.2 – UNAVOIDABLE RISKS

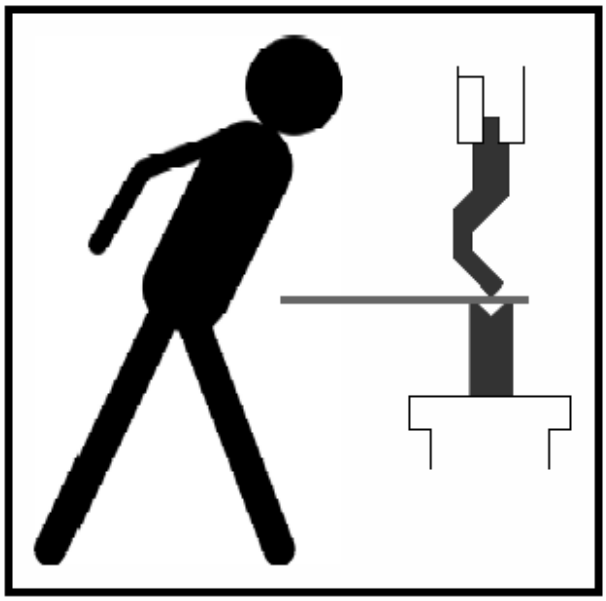


Figure 1

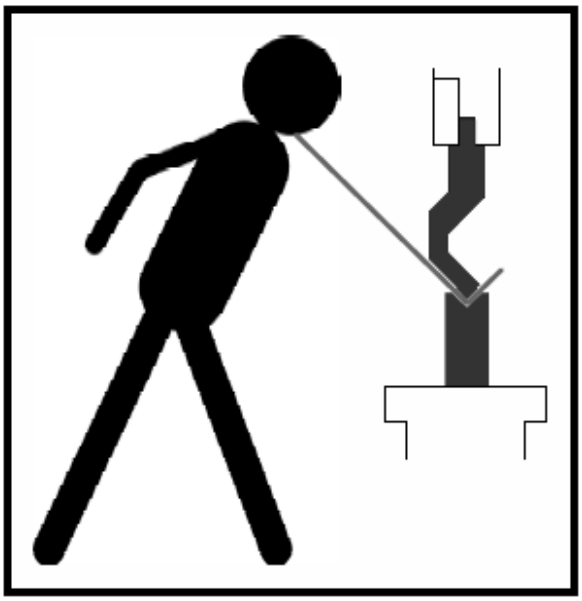


Figure 2

- Keep your hands away from bending axis while bending. Keep in mind that the part that is being bended is going to be elevated as much as the bending angle, therefore protect yourself from a hit by work piece. Take into consideration that the bended part would fall after the operation. Do not change the machine's tool adjustments while bending and do not let the protective cover safety switches be disabled.
- Do not approach to the moving parts of the machine while running. Regard the safety distance values.
- Never go inside the machine while bending.
- Sheet metal's part that is at the front side of the machine while bending might rise fast and hit the operator.

CHAPTER 2 – GENERAL DESCRIPTION OF THE MACHINE

2.1 – INTRODUCTION OF THE MACHINE

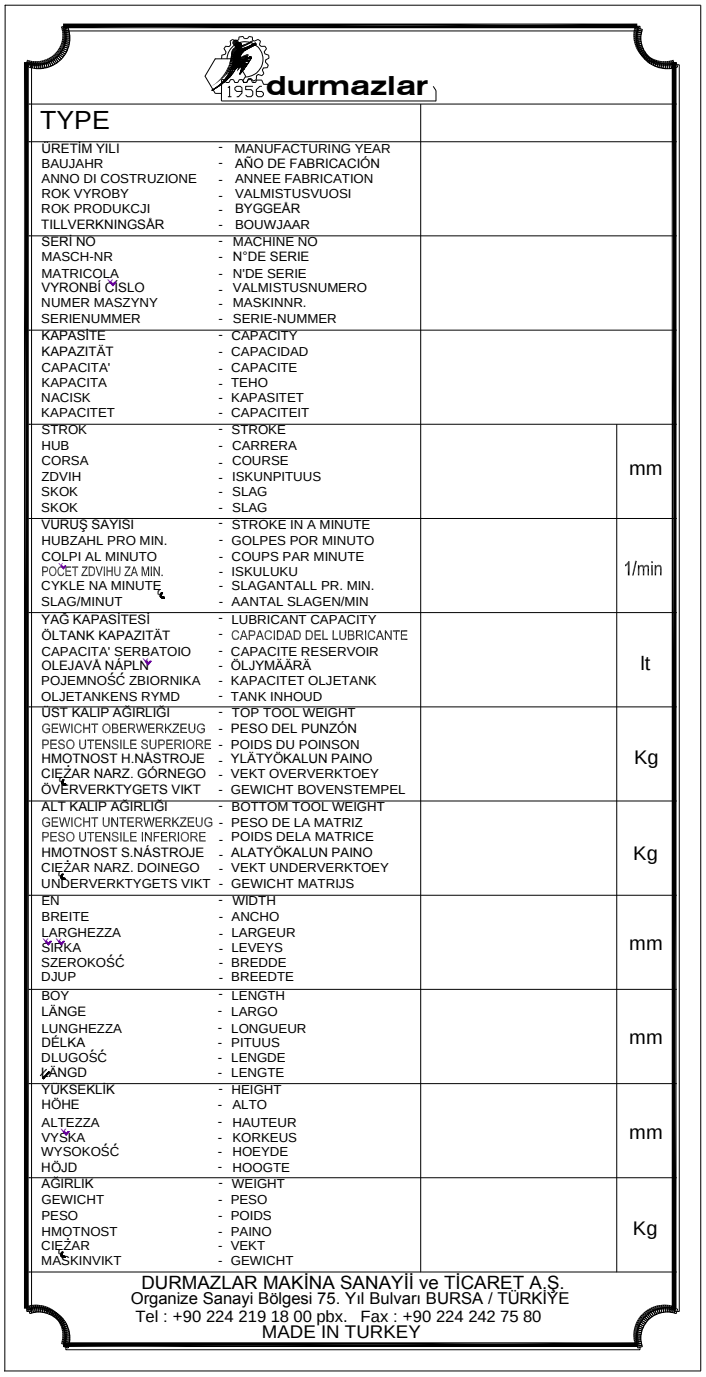
- Machine is produced with high technology and very sensitive tolerances. Tension elimination is done at the parts with large welding. All tension points are designed with large radius and possible weld cracks are eliminated.
- For minimum displacement, lower and upper table heights are designed at optimum values.
- Upper table is placed vertically; cylinder bearings, piston bearings and felts are designed in such a way that they can compensate vertical loads.
- Hydraulic cylinders have a two sided design and honed at a surface quality of 2 microns. By doing that, minimum abrasion resistance for the felts is obtained. Cylinder bodies are forged from SAE 1040 metal.
- Hydraulic cylinders are bound with bolts and wedges at the front sides of feet, therefore a perfect level of bearing and load balancing is provided.
- Piston head properties: Equipped with Omegat type felts, wide bronze bearings and half angled bearing bands.
- Pistons are sensitively grinded and coated with hardened chrome. The reason for that is to provide low friction and abrasion resistance while piston is moving towards the felts.
- Adjustable upper table sledges are made of ulpolen material, which is suitable for low friction resistance. They don't necessitate casting. In the displacement of upper table towards right-left or rear-front, those bearngs are organized for guidance.
- Our company designed the hydraulic blocks in a manner so that they provide a decrease in heat. Furthermore, the necessity for hydraulic pipes and fittings is minimized. This guarantees that the hydraulic system is being used reliably and at maximum level.
- When Durmazlar develops a hydraulic system, they always use accessible valves and high quality, safety and performance equipment without hesitation.
- Durmazlar is capable of reaching to very low pressure values by means of press and load sensing system at hydraulic. This is being yielded without unnecessary repetitions. It reduces the risk of extraordinary equipment loads to %2 - %3 of pressure values. By this means, absolute value of working pressure is obtained.
- Hydraulic system is being constantly protected from extraordinary loads by means of pressure limits. This is accomplished by the extraordinary pressure securing limits at CNC program.
- Durmazlar Hydraulic System allows sensitive usage at all pressure values up to maximum pressure value and in addition to that, with those pressure values sensitive positioning of the cylinder, synchronization and repeatability can be available.
- The hydraulic pipes are made of steel seamless pipes with St 35.4 quality according to DIN 2391 / CY.
- All electrical valves can be controlled with 24 dc voltage. For safety and endurance, all valves are equipped with indicators, which smoothes possible hits.
- The electric system is based on PLC. PCL system replaces the mechanical relays and increases the reliability. It shortens the response time of critical devices such as motors, valves or servo valves.
- PLC enables the monitoring of hydraulic and electrical conditions in functions. Input and output values can be followed easily. Diagnosed errors are illustrated on the screen as error messages.
- All valves, relays and limit switches have 24 V DC control voltage. This is the best way for safe working.

- The power method of main motor and hydraulic group enables the necessary power consumption.
- All CNC control flows are being controlled with DC servo movement units as closed circuit and optimal performance is provided. The speed and the definable values are optimally shown.
- The back gauge system is produced with respect to the environment conditions. The back gauge bearings is made for heavy conditions with double carriers and made by star, hiwin.
- Machine's outer surface is painted with 2 layers of paint which is 60 microns thick, which is protective against weather conditions.
- There is Y1, Y2, X, R production at standard axis.
- DNC control unit as cybelec or delem at standard production: CYBELEC MODEVA 10S, DELEM DA 66W control unit is being used.
- Machine has 2 year guarantee for everything including production defects, however except defects caused by misuse**.**

2.1.1 – MACHINE OPERATION PRINCIPLES

- Upper table's parallelism is being provided by linear encoders situated at Y1 and Y2 axes. The parallelism of upper table at every stroke position is being provided with servo valves that are being controlled by CNC control units. The parallelism of the machine is being provided with 1 % sensitivity while running.
- Upper table movement speed is optimized. There three rotational movement speeds of upper table: fast fall, bending speed, return speed. These speed values can be adjusted by means of CNC programming.
- A bending program can be easily implemented on the screen. In addition to this, 2D or 3D animation of the bending program can be observed on the screen. That feature facilitates the work of the operator effectively.
- Adjustments can be done faster at serie AD-S machines in comparison to conventional press brakes. For producing any part, in addition to fast programming, angle and bending parameters can be typed. At CNC press brakes, the bend operation's necessary tonnage, retraction, rear stop and bend rotation are adjusted automatically.
- When wrong parameter inputs or values exceeding limits are typed, an error message prompts. By that means, the possibility of performing a false operation by the operator is prevented.
- DNC control unit has automatic inch or metric system convertor.
- While using the DNC control unit, different languages can be selected.

2.2 – WARNING AND INTRODUCTION LABELS ON THE MACHINE


1956 durmazlar
TYPE
ÜRETİM YILI - MANUFACTURING YEAR
BAUJAHR - AÑO DE FABRICACIÓN
ANNO DI COSTRUZIONE - ANNEE FABRICATION
ROK VYROBY - VALMISTUSVUOSI
ROK PRODUKCJI - BYGGEÅR
TILLVERKNINGSÅR - BOUWJAAR
SERI NO - MACHINE NO
MASCH-NR - N°DE SERIE
MATRICOLA - N'DE SERIE
VYRONBÍ ČÍSLO - VALMISTUSNUMERO
NUMER MASZYNY - MASKINNR.
SERIENUMMER - SERIE-NUMMER
KAPASİTE - CAPACITY
KAPAZITÄT - CAPACIDAD
CAPACITA' - CAPACITE
KAPACITA - TEHO
NACISK - KAPASITET
KAPACITET - CAPACITEIT
STROK - STROKE
HUB - CARRERA
CORSA - COURSE
ZDVIH - ISKUNPITUUS
SKOK - SLAG
SKOK - SLAG
mm
VURUŞ SAYISI - STROKE IN A MINUTE
HUBZAHL PRO MIN. - GOLPES POR MINUTO
COLPI AL MINUTO - COUPS PAR MINUTE
POČET ZDVIHU ZA MIN. - ISKULUKU
CYKLE NA MINUTE - SLAGANTALL PR. MIN.
SLAG/MINUT - AANTAL SLAGEN/MIN
1/min
YAĞ KAPASİTESİ - LUBRICANT CAPACITY
ÖLTANK KAPAZITÄT - CAPACIDAD DEL LUBRICANTE
CAPACITA' SERBATOIO - CAPACITE RESERVOIR
OLEJAVÁ NÁPLŇ - ÖLJYMÄÄRÄ
POJEMNOŚĆ ZBIORNIKA - KAPACITET OLJETANK
OLJETANKENS RYMD - TANK INHOUD
lt
ÜST KALIP AĞIRLIĞI - TOP TOOL WEIGHT
GEWICHT OBERWERKZEUG - PESO DEL PUNZÓN
PESO UTENSILE SUPERIORE - POIDS DU POINSON
HMOTNOST H.NÁSTROJE - YLÄTYÖKALUN PAINO
CIĘŻAR NARZ. GÓRNEGO - VEKT OVERVERKTOEY
ÖVERVERKTYGETS VIKT - GEWICHT BOVENSTEMPEL
ALT KALIP AĞIRLIĞI - BOTTOM TOOL WEIGHT
GEWICHT UNTERWERKZEUG - PESO DE LA MATRIZ
PESO UTENSILE INFERIORE - POIDS DELA MATRICE
HMOTNOST S.NÁSTROJE - ALATYÖKALUN PAINO
CIĘŻAR NARZ. DOINEGO - VEKT UNDERVERKTOEY
UNDERVERKTYGETS VIKT - GEWICHT MATRIJS
Kg
EN - WIDTH
BREITE - ANCHO
LARGHEZZA - LARGEUR
ŠÍŘKA - LEVEYS
SZEROKOŚĆ - BREDDE
DJUP - BREEDTE
mm
BOY - LENGTH
LÄNGE - LARGO
LUNGHEZZA - LONGUEUR
DÉLKA - PITUUS
DLUGOŚĆ - LENGDE
LÄNGD - LENGTE
mm
YÜKSEKLİK - HEIGHT
HÖHE - ALTO
ALTEZZA - HAUTEUR
VÝŠKA - KORKEUS
WYSOKOŚĆ - HOEYDE
HÖJD - HOOGTE
mm
AĞIRLIK - WEIGHT
GEWICHT - PESO
PESO - POIDS
HMOTNOST - PAINO
CIĘŻAR - VEKT
MASKINVIKT - GEWICHT
Kg
DURMAZLAR MAKİNA SANAYİİ ve TİCARET A.Ş.
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MADE IN TURKEY

LABEL-1

Motor - Motor
Motorleistung - Potencia del motor
Potenza Motore - Moteur
Motor - Moottori
Silnik - Motorkapasitet
Motoreffekt - Motorvermogen
KW
Faz - Phase
Stromart - Fase
Fasi - Phase
Fáze - Vaihe
Ilość faz - Fase
Antal faser - Phase
~
Frekans - Frequency
Frequenz - Frecuencia
Frequenza - Frequence
Frekvence - Taajuus
Częstotliwość - Frekvenz
Frekvens - Frequentie
Hz
Çalışma gerilimi - Working voltage
Betriebsspannung - Voltaje de trabajo
Voltaggio - Tension d'alimentation
Pracovní napětí - Jännite
Napięcie zasilania - Driftsspenning
Driftspänning - Bedrijfsspanning
V
Kumanda gerilimi - Command voltage
Steuerspannung - Voltaje de dominio
Tensione comandi - Tension de commande
Řídící napětí - Ohjausjännite
Napięcie sterowania - Styrespenning
Manöverspänning - Stuurspanning
V
Akım - Current
Nennstrom - Intensidad
Assorbimento - Intensité
Proud - Virta
Prąd - Nettstroem
Driftströmstyrka - Netspanning
A
Ara sigorta akımı - Intermediate fuse current
Nennstrom der Hauptsicherung - Corte de corriente
Fusibile intermediario - Puissance totale
Střední proud - Nimellisvirta
Zabezpieczenie prądowe - Total hovedsikring
Huvudsäkring - Hoofdzekering
A
Elektrik devre no - E. circuit scheme no
E, schaltplan - Circuito E, esquema n°
Schema elettrico n° - Circuit E, Schéma n°
El. schèma - Kytkentäkaava
Nr maszyny - E.skjaltplan nr.
Elschemats nr. - Schema no
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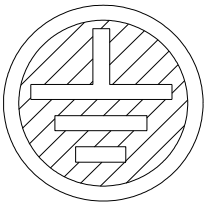
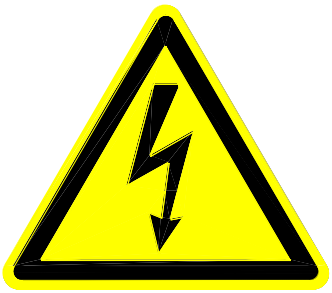
LABEL-2



LABEL-3

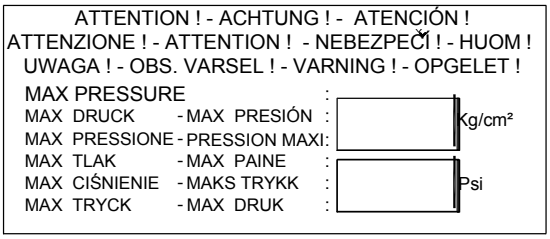
LABEL-4

Label – 1: Machine Identification Label
Label – 2: Machine Power Information Introduction Label
Label–3: Grounding Label
Label–4: Label that shows turning direction of machine



LABEL-5

LABEL-6


ATTENTION ! - ACHTUNG ! - ATENCIÓN !
ATTENZIONE ! - ATTENTION ! - NEBEZPEČÍ ! - HUOM !
UWAGA ! - OBS. VARSEL ! - VARNING ! - OPGELET !
MAX PRESSURE :
MAX DRUCK - MAX PRESIÓN :
MAX PRESSIONE - PRESSION MAXI:
MAX TLAK - MAX PAINE :
MAX CIŚNIENIE - MAKS TRYKK :
MAX TRYCK - MAX DRUK :
Kg/cm²
Psi

Label – 5: Electricity Warning Label

Label – 6: Label that Shows Maximum Pressure

WARNING
DO NOT GO NEAR LEAKS
High pressure oil easily punctures skin causing serious injury. If injured seek emergency medical help. Relieve pressure before loosening fittings.

LABEL - 7

Label – 7: Hydraulic system leakage warning label. High pressure lubricant might cause serious injuries. Before doing anything about the leakage, reduce the pressure first.

LABEL - 8

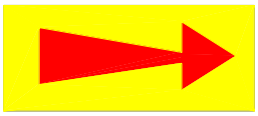
Label – 8: Warning. Hydraulic lubricant amount must be between the red line and the black line on the lubricant indicator.

LABEL - 9 LABEL - 10 LABEL - 11

Label – 9: Protect yourself from the danger of being stuck between upper tool and workpieces.
Label – 10: Don't forget that the piece to be bended will raise during the operation, therefore protect your body from a hit of the workpiece.

Label – 11: Don't place your hand between the upper and lower tools during the operation.

Label – 12: Greasing label; it indicates the places to be lubricated.

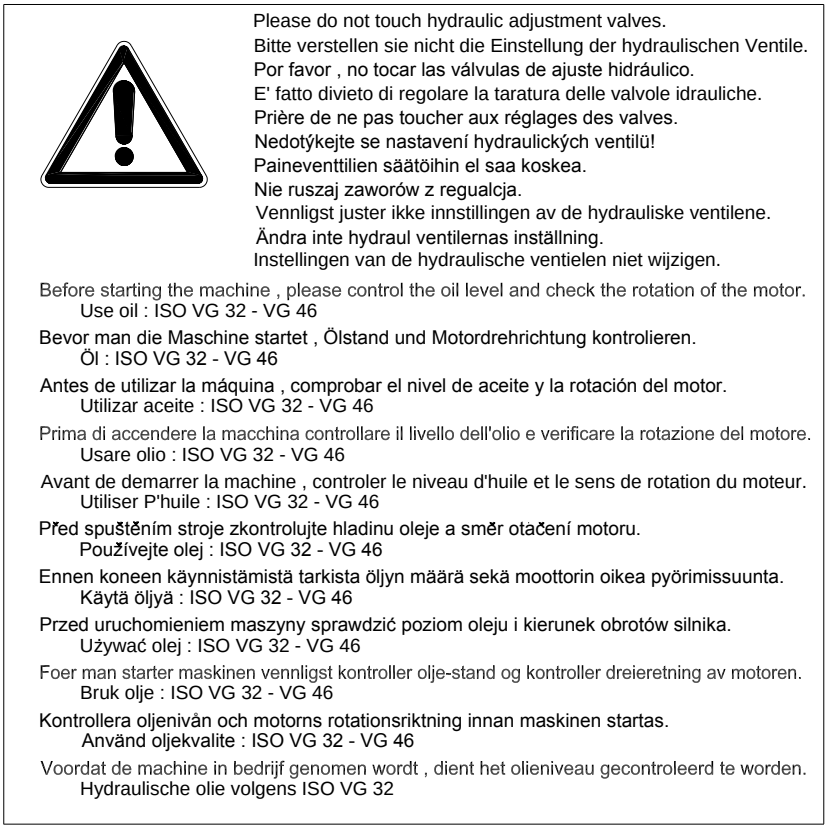


LABEL - 12

Falling Time After Stopping Nachlaufzeit Tempo discesa dopo lo stop Doba k zastavení Czas zatrzymania belki Tidsfördröjning vid nödstopp	- Tiempo de descenso despues de parar - Temps ecoule apres arret - Pysähdysaika - Foelgetid - Nalooptijd		ms
Traversing Distance After Stopping Nachlaufweg Movimento dopo lo stop Dojezd po zastavení Droga zatrzymania Fallrörelse vid nödstopp	- Recorrido despues de parar - Distance parcourue apres arret - Pysähdysmatka - Foelgevei - Naloopweg		mm
Safety Distance Sicherheitabstand Distanza di sicurezza Vzdálenost nad plechem Odległość bezpieczna Säkerhetsavstånd	- Distancia de seguridad - Distance de securite - Turvaetäisyys - Sikkerhetsavstand - Veiligheidsafstand		mm

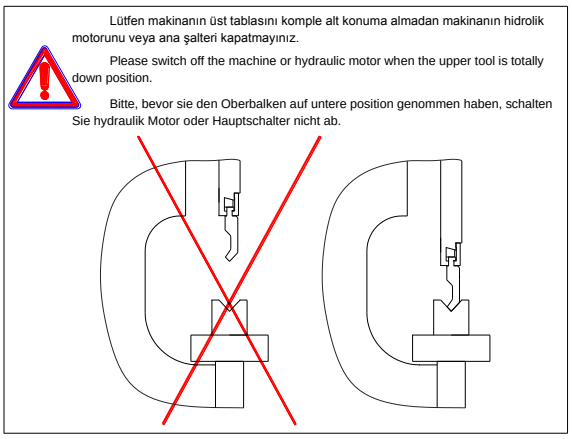
LABEL - 13

Label – 13: Safety distance label; it indicates, when the light curtain is cut off, when and where the machine will stop, and the distance between safety barrier and danger area.


Please do not touch hydraulic adjustment valves.
Bitte verstellen sie nicht die Einstellung der hydraulischen Ventile.
Por favor , no tocar las válvulas de ajuste hidráulico.
E' fatto divieto di regolare la taratura delle valvole idrauliche.
Prière de ne pas toucher aux réglages des valves.
Nedotýkejte se nastavení hydraulických ventilů!
Paineventtilien säätöihin el saa koskea.
Nie ruszaj zaworów z regualcja.
Vennligst juster ikke innstillingen av de hydrauliske ventilene.
Ändra inte hydraul ventilernas inställning.
Instellingen van de hydraulische ventielen niet wijzigen.
Before starting the machine , please control the oil level and check the rotation of the motor.
Use oil : ISO VG 32 - VG 46
Bevor man die Maschine startet , Ölstand und Motordrehrichtung kontrolieren.
Öl : ISO VG 32 - VG 46
Antes de utilizar la máquina , comprobar el nivel de aceite y la rotación del motor.
Utilizar aceite : ISO VG 32 - VG 46
Prima di accendere la macchina controllare il livello dell'olio e verificare la rotazione del motore.
Usare olio : ISO VG 32 - VG 46
Avant de demarrer la machine , controler le niveau d'huile et le sens de rotation du moteur.
Utiliser P'huile : ISO VG 32 - VG 46
Před spuštěním stroje zkontrolujte hladinu oleje a směr otačení motoru.
Používejte olej : ISO VG 32 - VG 46
Ennen koneen käynnistämistä tarkista öljyn määrä sekä moottorin oikea pyörimissuunta.
Käytä öljyä : ISO VG 32 - VG 46
Przed uruchomieniem maszyny sprawdzić poziom oleju i kierunek obrotów silnika.
Używać olej : ISO VG 32 - VG 46
Foer man starter maskinen vennligst kontroller olje-stand og kontroller dreieretning av motoren.
Bruk olje : ISO VG 32 - VG 46
Kontrollera oljenivån och motorns rotationsriktning innan maskinen startas.
Använd oljekvalite : ISO VG 32 - VG 46
Voordat de machine in bedrijf genomen wordt , dient het olieniveau gecontroleerd te worden.
Hydraulische olie volgens ISO VG 32

LABEL – 14

Label – 14: Hydraulic system warning label; do not touch or adjust the valves on the machine's hydraulic system. Before operating the machine, be sure that the hydraulic lubricant is at an appropriate level, and check the motor's direction of rotation. Our lubricant recommendation is ISO VG32-VG 46.

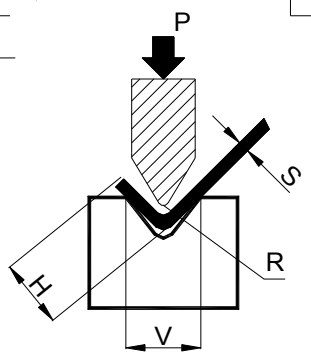

Lütfen makinanın üst tablasını komple alt konuma almadan makinanın hidrolik motorunu veya ana şalteri kapatmayınız.
Please switch off the machine or hydraulic motor when the upper tool is totally down position.
Bitte, bevor sie den Oberbalken auf untere position genommen haben, schalten Sie hydraulik Motor oder Hauptschalter nicht ab.

LABEL - 15

Label – 15: Place the upper table to lower position, before shutting down the hydraulic motor and main switch.

V	H (Min.)	R	S (mm.)																					
			0.5	0.8	1	1.2	1.5	1.8	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10	12	15	18	20
6	5	1	2.5	6.5	10																			
8	6	1.3	2	5	8	11																		
10	7	1.7	1.5	4	6	9	13																	
12	9	2		3	5	7	11	16																
15	12	2.7			4	6	9	13	16															
20	15	3.3				4	7	10	12	19														
26	18	4.2					5	7.5	9	14	21													
30	22	5						6.5	8	12	19	24												
32	23	5.4							7.5	11.6	17	23	30											
37	25	5.8								10	14.5	20	26	33										
42	29	6.7									13	17	23	29	35.5									
45	32	7.5										16	21	27	33	48								
50	36	8.3											19	24	30	43	58							
60	43	10												20	25	36	49	64						
70	50	11.5													21	31	42	55	69					
80	57	13.5														27	37	48	60	75				
90	64	15															32	42	54	66	95			
100	71	17																38	48	60	86	134		
130	93	22																	37	46	66	103	149	
180	130	30																		33	48	75	107	133
200	145	33																			43	67	97	119
250	180	42																				54	77	95

$$P = \frac{1.42 \times \sigma \times S^2 \times l}{1000 \times V} (Ton)$$



□ Capacity (ton)

L : Sheet length (mm) (L = 1000 mm)

R : Internal radius (mm)

σ Tensile strength (kg/mm²)

V : Mould opening (mm)

P : Needed tonage (Ton)

H : Min. sheet bending length (mm)

S : Sheet thickness (mm)

LABEL – 16

Label – 16: Bending Diagram

Sicherheitshinweise

Lesen und beachten Sie bitte vor Inbetriebnahme der Maschine Bedienungdanleitung und Warnschilder an der Maschine.

Gefahren , die vom versehentlichen Kontakt mit beweglichen Teilen kommen , sind folgendermassen zu vermeiden :

- Tragen Sie keine weite Bekleidung oder Schmuck , da dies zu Unfällen führen kann. Für Ihren eigenen Schutz tragen Sie bei der Arbeit immer Sicherheitsschuhe.
- Keine Einstell-sowie Wartungsarbeiten bei laufender Maschine vornehmen. Maschine vom Netz trennen , wenn sie nicht benutz wird.
- Arbeiten Sie nur mit Werkzeugen , die für die Maschine entsprechend geeignet sind. Setzen Sie nur unbeschädigte Werkzeuge an der Maschine ein.
- Unterlassen Sie jegliche Zweckentfremdung der Maschine und des Zubehörs.

- Dieses Warnschild nicht von der Maschine entfernen -

Safety Instruction

Read the instruction manual and the warning plates on the machine before operating the machine and take them into consideration.

For the machine's safety and your safety :

- Do not wear loose clothes or ornaments , these cause accidents.
- Wear safety-shoes while working for your safety.
- Never adjust or repair when the machine is running. If not in use, disconnect the machine from the network.
- Work only with the tools appropriate to the machine.
- Use only the tools that are not damaged to the machine.
- Never use the parts that are not fitting to the machine.

- Never remove this warning plate from the machine -

Instrucciones de seguridad

Lea atentamente el manual de instrucciones y las placas de seguridad antes de utilizar la máquina y manténgalo cerca por si le surgiera alguna duda.

Para su seguridad y la de la máquina :

- No utilice ropas holgadas ni adornos, pueden ocasionar accidentes.
- Por su seguridad, utilice calzado de seguridad durante el trabajo.
- Nunca ajuste o repare la máquina mientras ésta conectada. Desconecte la máquina de la red.
- Utilice solamente las herramientas de la máquina.
- No utilice herramientas que puedan estar dañadas.
- Nunca utilice piezas que no correspondan a la máquina.

- Jamás quite esta placa de seguridad de la máquina.

Avvertimenti

Leggere attentamente il manuale istruzioni e le targhette di avvertimento applicate alla macchina prima di compiere qualsiasi manovra con la macchina.

Per la Vs. sicurezza e quella della macchina :

- non indossare abiti di taglia superiore o ornamenti : sono causa di infortuni
- indossare scarpe antinfortunistiche mentre si lavora
- mai regolare o riparare la macchina durante il suo funzionamento. Se non utilizzata disconnettere la macchina dalla linea elettrica
- lavorare solo con utensili appropriati alla macchina
- usare solo utensili non danneggiati
- non utilizzare parti o componenti non forniti in dotazione alla macchina

- mai rimuovere o rendere illeggibile tale targhetta di avvertimento -

Instruction de sécurité

Lire le manuel d'instruction et les plaques d'avertissement avant toute mise en service.

Pour votre sécurité et celle de la machine :

- Ne pas porter de vêtements flottants ainsi que des bijoux , car ils peuvent être à l'origine d'accidents.
- Porter des chaussures de sécurité lors de l'utilisation de la machine.
- Ne jamais régler ou réparer la machine en fonctionnement , débrancher la machine de l'alimentation avant chaque intervention.
- Utiliser les outils appropriés à la machine.
- Lors de réparations n'utiliser que des pièces d'origine.

- Ne jamais enlever cette plaque de la machine.

Veiligheidsaanwijzing

Lees en neem vóór inbedrijfname van de machine de handleiding en waarschuwingsborden die op de machine gemonteerd zijn goed door.

Gevaarlijke situaties , kontakt met bewegende onderdelen kunnen als volgt vermeden worden :

- Draag geen te wijde kleding of sieraden , die tot ongevallen kunnen leiden. Draag altijd veiligheidsschoenen.
- Instel- en onderhoudswerkzaamheden nooit bij een lopende machine uitvoeren. Sluit de machine af van het elektriciteitsnet , als deze niet gebruikt wordt.
- Gebruik immer passend en voor het doel geeigende gereedschappen. Gebruik alleen onbeschadigde gereedschappen en onderdelen.
- Laat alleen vakbekwame , voor deze machine opgeleide onderhoudstechnici , onderhoudswerkzaamheden aan deze machine uitvoeren en zorg ervoor dat geen machine vreemde obstakels en / of toebehoren worden gemonteerd.

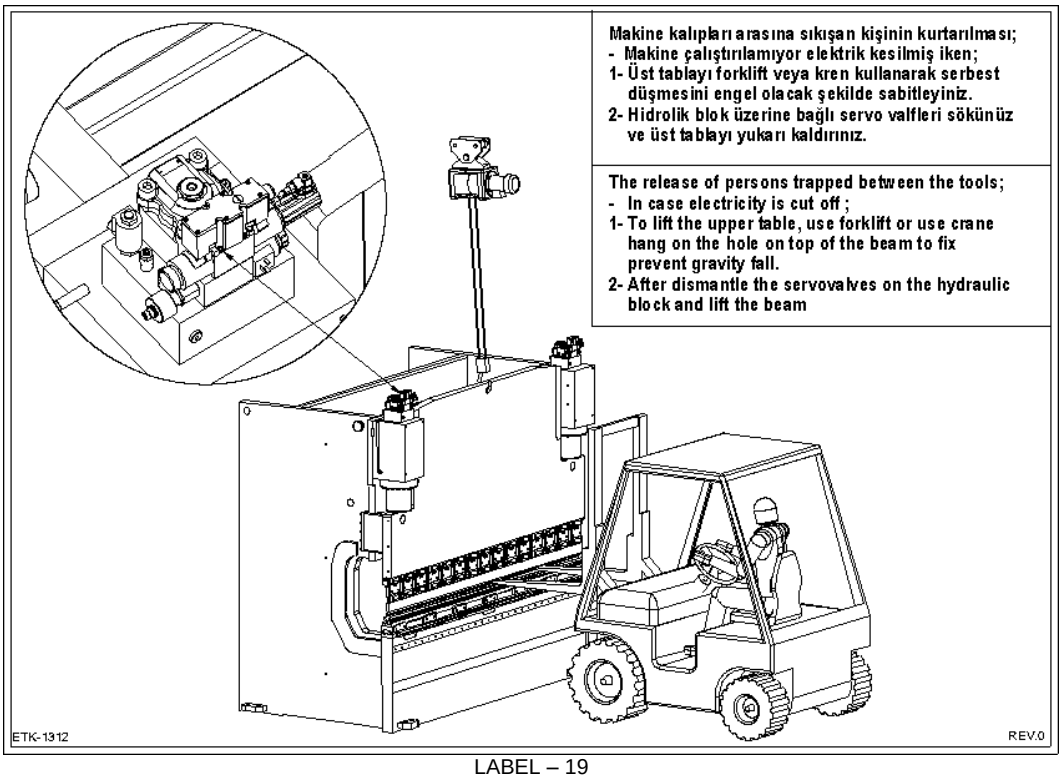
- Dit waarschuwingsbord niet verwijderen. -

LABEL – 17

Label – 17: Safety usage information.

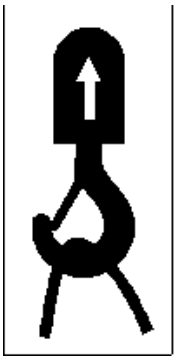
LABEL – 18

Label – 18 : No lubricant in reservoir. Do not operate the machine without filling it with enough lubricant.


Makine kalıpları arasına sıkışan kişinin kurtarılması;
- Makine çalıştırılamıyor elektrik kesilmiş iken;
1- Üst tablayı forklift veya kren kullanarak serbest düşmesini engel olacak şekilde sabitleyiniz.
2- Hidrolik blok üzerine bağlı servo valfleri sökünüz ve üst tablayı yukarı kaldırınız.
The release of persons trapped between the tools;
- In case electricity is cut off ;
1- To lift the upper table, use forklift or use crane hang on the hole on top of the beam to fix prevent gravity fall.
2- After dismantle the servovalves on the hydraulic block and lift the beam
ETK-1312
REV.0

LABEL – 19

Label – 19: Saving a person who is trapped between machine molds; if there is no power on the machine; grab the upper table with forklift from the hole on upper table with a crane. Then, disassemble the valves on hydraulic blocks and raise the table.



LABEL – 20

Label – 20 : The tag illustrating the lifting point on the machine. Location is next to lifting lug.

LABEL – 21

Label – 21 : Before maintenance depressurized the hydraulic system. Location is on the hydraulic system.

LABEL – 22

Label – 22: Do not enter rear danger area of machine while in operation. This situation causing bodily injury even dead. It is the employer's responsibility. Location is rear of the machine.

LABEL – 23

Label – 23 : 'Fixed guards must be in position before use.' Location is all the fixed guards on the machine.

LABEL – 24

Label – 24 : 'Trip hazard'. Location is back gauge system because of x-axis movement cause trip hazard.

2.3- PROHIBITED APPLICATIONS

- No connection except the electric scheme should be done and no material should be used except the ones that were indicated on the scheme.
- Main switch locked on the panel is being used. When the panel is open, machine doesn't run. Never work on the machine when panel cover is open.
- Do not bypass the lateral and rear protection cover switches.
- Never cancel the rear photocells.
- Do not change the adjustments of pressure safety valves on hydraulic system.
- Never bypass the frontal safety system on the machine.
- Do not change the speed adjustments and machine parameters.
- Do not leave the tools fixation screws loosened.
- Lower tool must be precisely aligned with its center.

2.4 – SAFETY SWITCHES AND GUARDS ON THE MACHINE

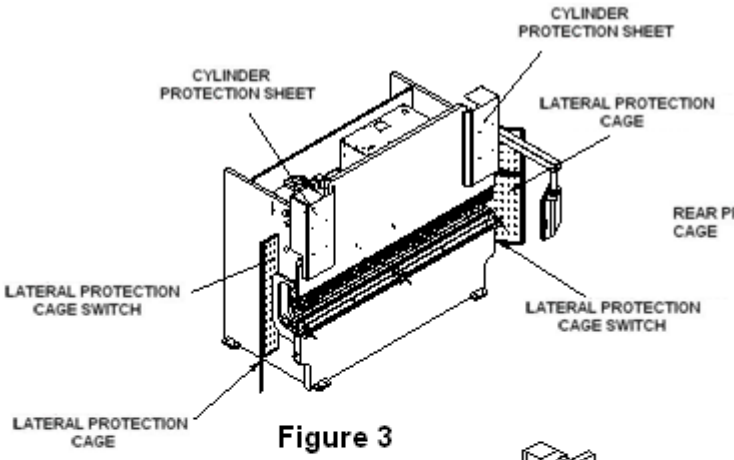


Figure 3

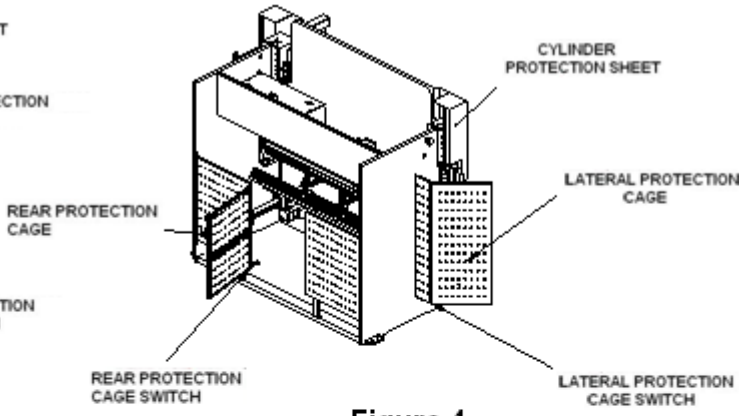


Figure 4

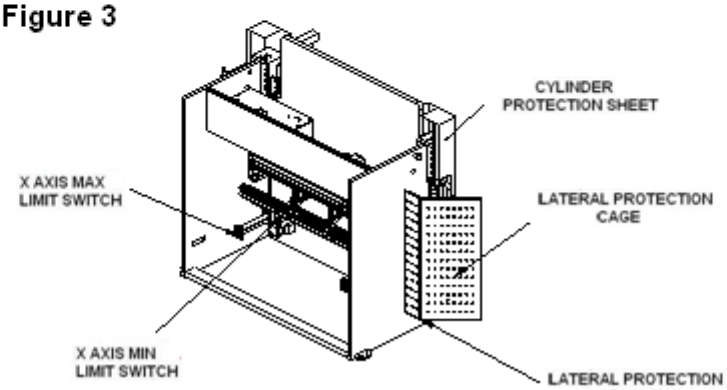

CYLINDER PROTECTION SHEET
X AXIS MAX LIMIT SWITCH
LATERAL PROTECTION CAGE
X AXIS MIN LIMIT SWITCH
LATERAL PROTECTION CAGE SWITCH

Figure 5

If the rear protective cages exist in the machine;

Protective Side Cage Switch: While the machine is running, if one or the both lateral cages are opened, upper table will stay stationary at its position and hydraulic pump will stop. In such a case, press the EMERGENCY RESET-RESTART button for starting the machine again. Then press the HYD. PUMP button. (See: Figure 3)

Protective Rear Cage Switch: While the machine is running, if rear side cage is opened, upper table will stay stationary at its position and hydraulic pump will stop. In such a case press the EMERGENCY RESET-RESTART button for starting the machine again. Then press the HYD. PUMP button. (See: Figure 4)

X Axis Min / Max Limit Switch: Rear leaning axis' (X) movements are limited at minimum (-) and maximum (+) points with limit switches. (See: Figure 5)

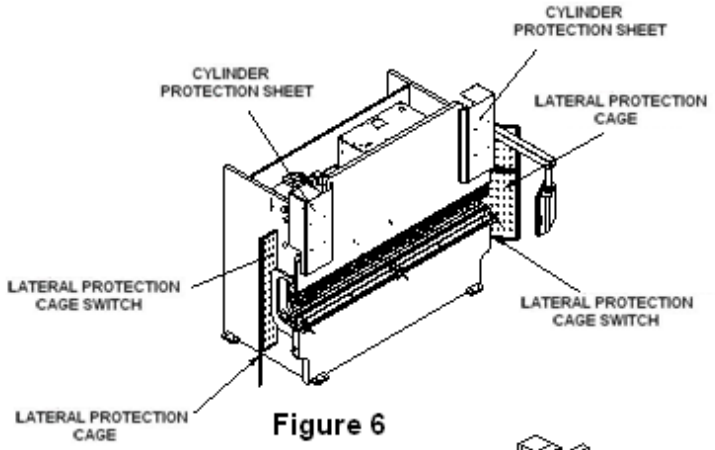


Figure 6

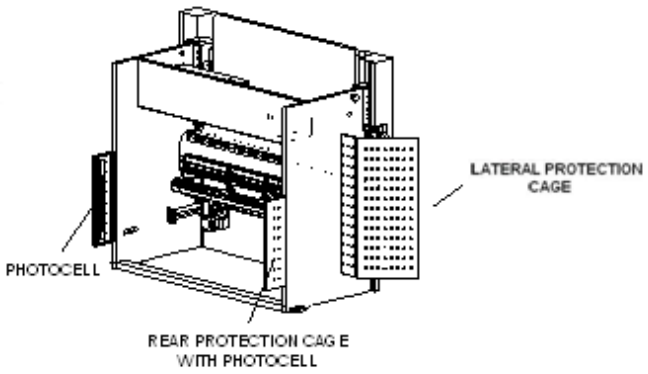


Figure 7

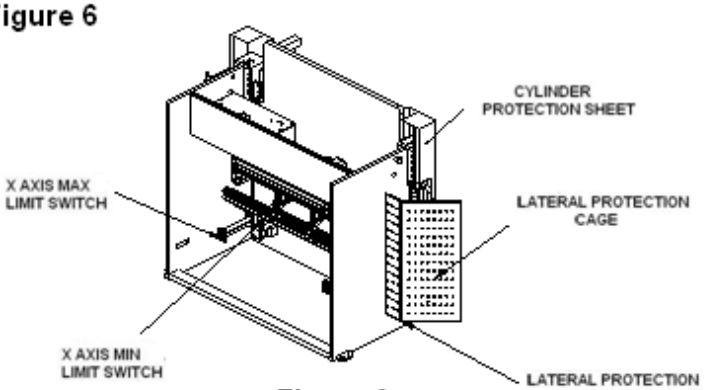

CYLINDER PROTECTION SHEET
X AXIS MAX LIMIT SWITCH
LATERAL PROTECTION CAGE
X AXIS MIN LIMIT SWITCH
LATERAL PROTECTION CAGE SWITCH

Figure 8

If protective side cage and protective rear cage with photocell exists on the machine;

Protective Side Cage Switch: While the machine is running, if one or the both side cages are opened, upper table will stay stationary at its position and hydraulic pump will stop. In such a case press the EMERGENCY RESET-RESTART button for starting the machine again. Then press the HYD. PUMP button. (See: Figure 6)

Protective Rear Cage with Photocell: While the machine is running, if an object gets through between the sensors, the upper table will stay stationary at its position and hydraulic pump will stop. In such a case press the EMERGENCY RESET-RESTART button for starting the machine again. Then press the HYD. PUMP button. (See: Figure 7)

R Axis Min / Max Limit Switch: Rear leaning axis' (R) movements are limited at minimum (-) and maximum (+) points with limit switches. (See: Figure 8)

X Axis Min / Max Limit Switch: Rear leaning axis' (X) movements are limited at minimum (-) and maximum (+) points with limit switches. (See: Figure 9)

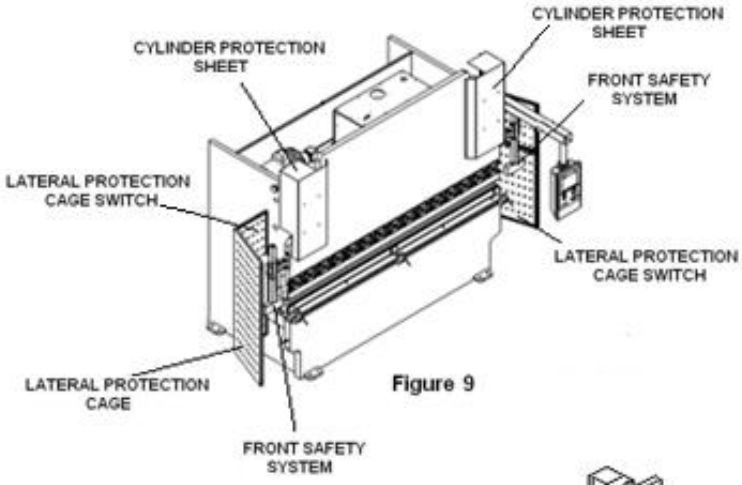


Figure 9

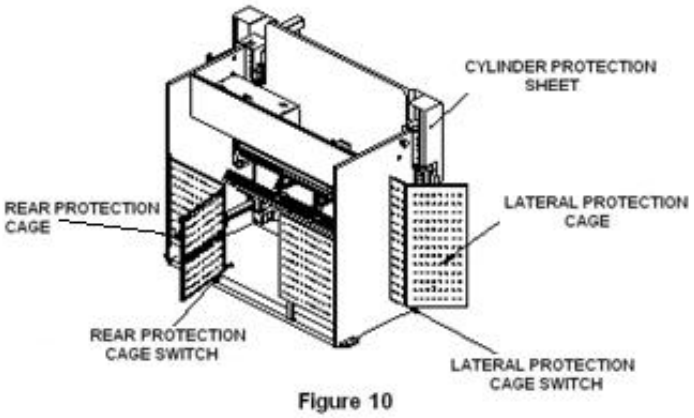


Figure 10

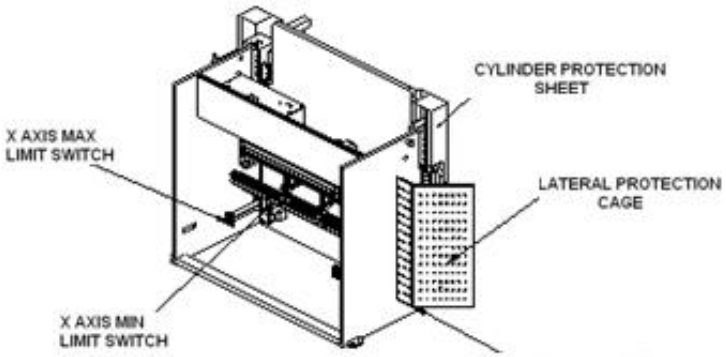

CYLINDER PROTECTION SHEET
X AXIS MAX LIMIT SWITCH
LATERAL PROTECTION CAGE
X AXIS MIN LIMIT SWITCH
LATERAL PROTECTION CAGE SWITCH

Figure 11

If frontal safety, protective side cage and protective rear cage exist on your machine;

Protective Side Cage Switch: While the machine is running, if one or the side cages are opened, upper table will continue to displace downwardly slowly. If the cage is closed and the pedal is pressed again, the upper table will continue to displace downwardly fast.

If both of the side cages are opened, the upper table stays stationary at its position and hydraulic pump will stop. In such a case press the EMERGENCY RESET-RESTART button for starting the machine again. Then press the HYD. PUMP START button. (See: Figure 9)

Protective Rear Cage Switch: While the machine is running, if rear side cage Fis opened, upper table will stay stationary at its position and hydraulic pump will stop. In such a case press the EMERGENCY RESET-RESTART button for starting the machine again. Then press the HYD. PUMP START button. (See: Figure 10)

R Axis Min / Max Limit Switch: Rear leaning axis' (R) movements are limited at minimum (-) and maximum (+) points with limit switches. (See: Figure 11)

X Axis Min / Max Limit Switch: Rear leaning axis' (X) movements are limited at minimum (-) and maximum (+) points with limit switches. (See: Figure 11)

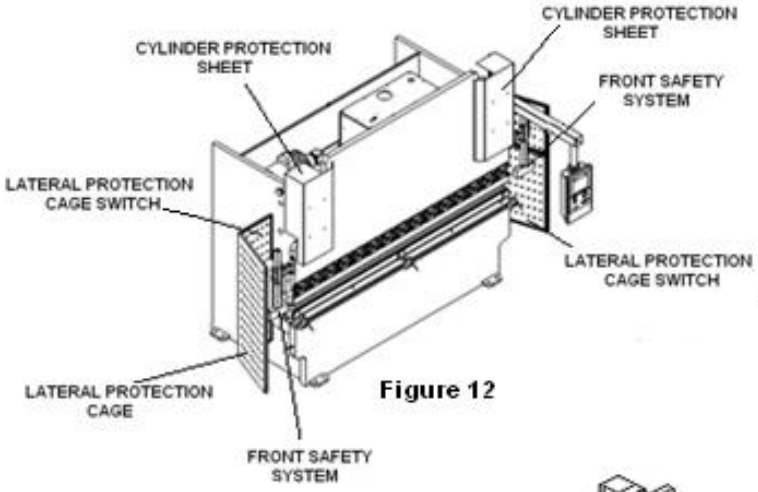


Figure 12

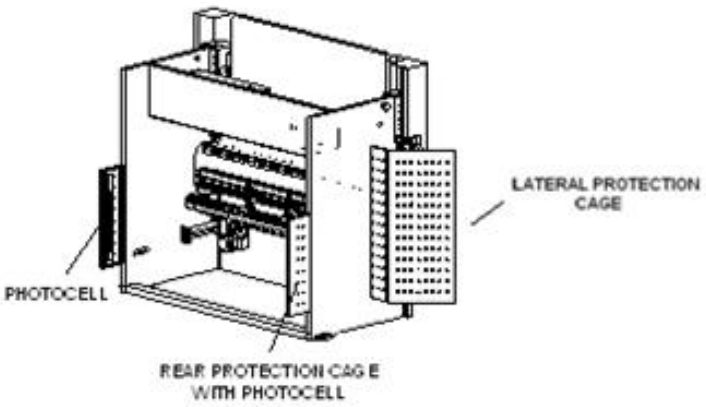


Figure 13

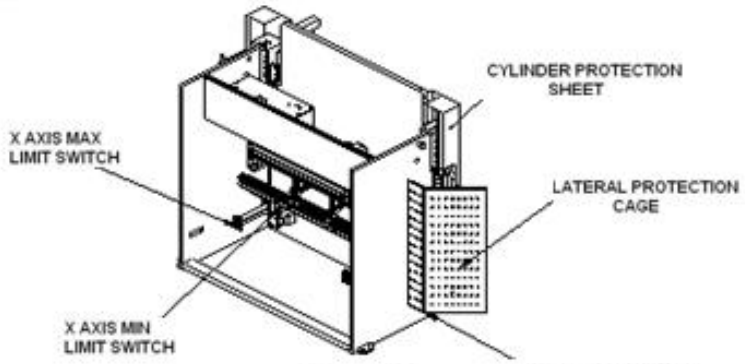

CYLINDER PROTECTION SHEET
X AXIS MAX LIMIT SWITCH
LATERAL PROTECTION CAGE
X AXIS MIN LIMIT SWITCH
LATERAL PROTECTION CAGE SWITCH

Figure 14

If frontal safety, protective side cage and and protective rear cage with photocell exist on your machine;

Protective Side Cage Switch: While the machine is running, if one or the side cages are opened, upper table will continue to displace downwardly slowly. If the cage is closed and the pedal pressed again, the upper table will continue to displace downwardly fast.

If both of the side cages are opened, the upper table stays stationary at its position and hydraulic pump will stop. In such a case press the EMERGENCY RESET-RESTART button for starting the machine again. Then press the HYD. PUMP START button. (See: Figure 12)

Protective Rear Cage with Photocell: While the machine is running, if an object gets through between the sensors, the upper table will stay stationary at its position and hydraulic pump will stop. In such a case press the EMERGENCY RESET button for starting the machine again. Then press the HYD. PUMP START button. (See: Figure 13)

R Axis Min / Max Limit Switch: Rear leaning axis' (R) movements are limited at minimum (-) and maximum (+) points with limit switches. (See: Figure 14)

X Axis Min / Max Limit Switch: Rear leaning axis' (X) movements are limited at minimum (-) and maximum (+) points with limit switches. (See: Figure 14)

2.5 – LIGHT BARRIER SAFETY CALCULATION

According to TS EN 12622 Appendix-A;

$S = (K \times T) + C$

S: Safety distance (mm)
T: Stopping performance time of the whole system (s)
C: Additional distance

$T = t_1 + t_2 + t_3 + \Delta t$

t_1=Response time of the hydraulic system in press brake
t_2 = Safety protection system's response time
t_3 = Rest of the calculable response times
Δt =Uncertainity

K = 2000 mm/s is chosen. (According to TS EN 12622 Appendix - A.2)

t_1 = 63 ms (The measurement that we made by means of the testing device)
t_2 =17 ms (SICK C4000 ADVANCED)
T = 63+17=80 ms = 0,08 s

C = Beam barrier sensing capability (According to TS EN 12622 Appendix-A.6 , C=0 found.)

$S = (2000 \times 0{,}08) + 0$

S=160 mm

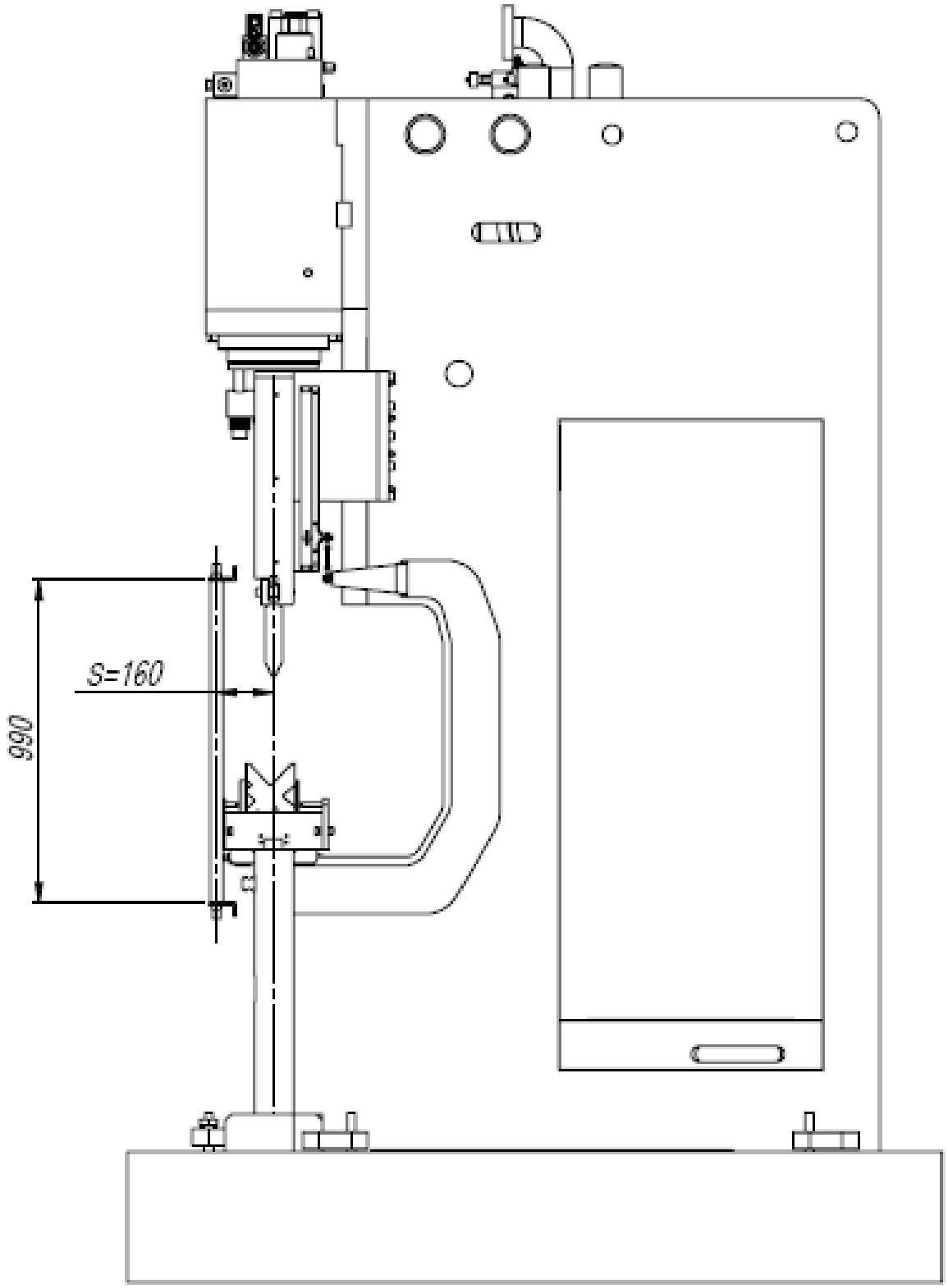


Figure 15

2.6 – PROTECTIVE SIDE CAGE DIMENSIONS

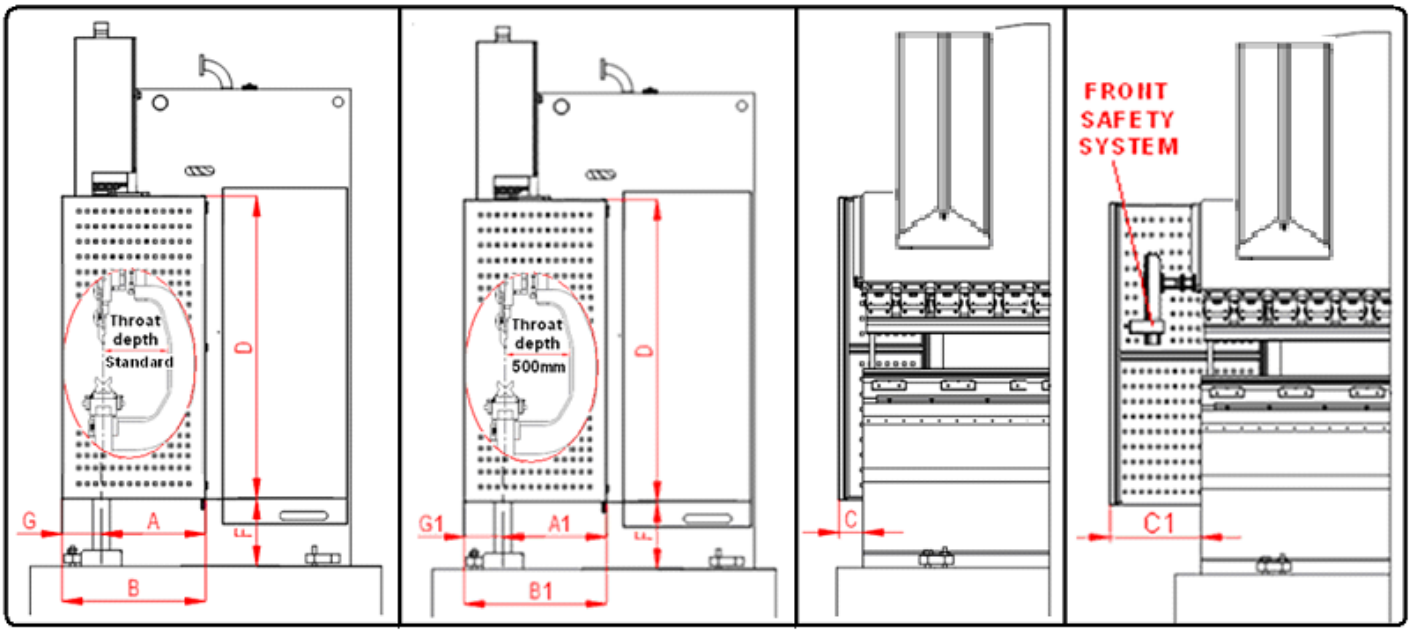


Figure 16

Machine Name	A(mm)	B(mm)	C(mm)	D(mm)	F(mm)	G(mm)	A1(mm)	B1(mm)	C1(mm)	G1(mm)
AD-R 2060										
AD-R 25100										
AD-R 30100										
AD-R 30135	640	890	245	1600	300	250	-	-	440	-
AD-R 30175	640	890	255	1600	300	250	-	-	410	-
AD-R 37175										
AD-R 40175										
AD-R 30220	640	890	220	1600	300	250	-	-	440	-
AD-R 37220										
AD-R 40220										
AD-R 60220	640	890	190	1800	300	250	-	-	-	-
AD-R 30320										
AD-R 40320										
AD-R 60320										
AD-R 30400										
AD-R 40400										
AD-R 60400										
AD-R 40600										
AD-R 60600	-	-				-				

Table 1

2.7 – SAFETY AREAS ON THE MACHINE

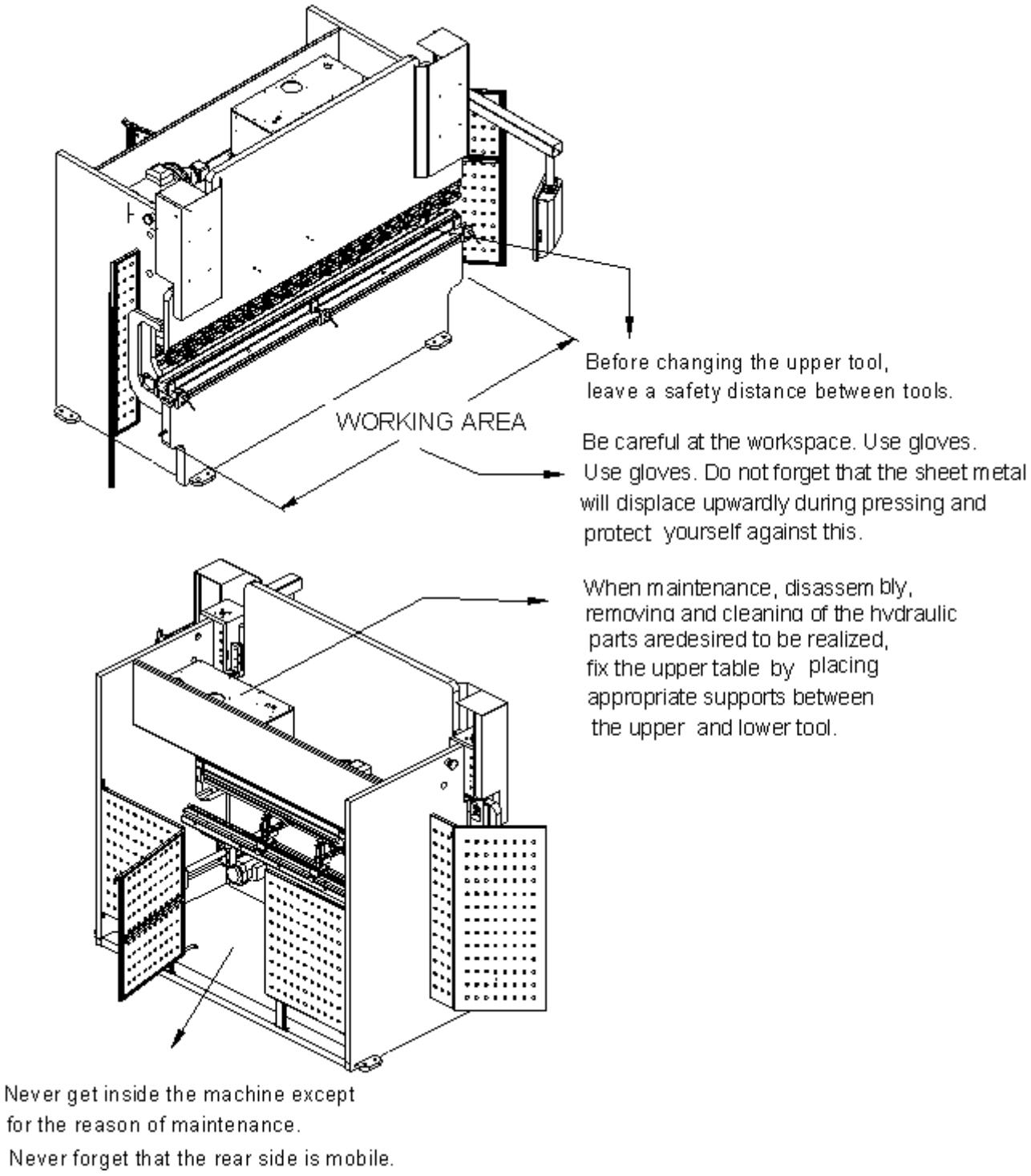

WORKING AREA
Before changing the upper tool,
leave a safety distance between tools.
Be careful at the workspace. Use gloves.
Use gloves. Do not forget that the sheet metal
will displace upwardly during pressing and
protect yourself against this.
When maintenance, disassem bly,
removing and cleaning of the hydraulic
parts aredesired to be realized,
fix the upper table by placing
appropriate supports between
the upper and lower tool.
Never get inside the machine except
for the reason of maintenance.
Never forget that the rear side is mobile.

Figure 17

2.8 –TECHNICAL DATA OF THE MACHINE

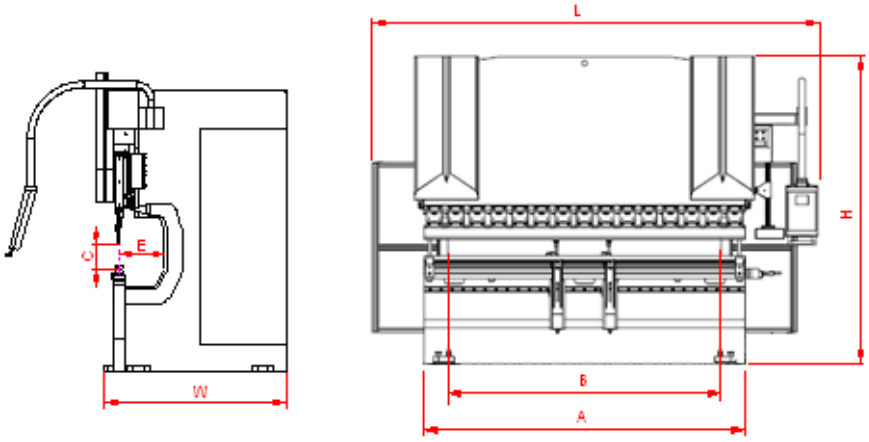


Figure 18

TYPE	Bendiing Tonnage	Bening Length	Distance Between Columns	Approach Speed	Bending Speed	Return Speed	Stroke	Throat Depth	Motor Power	Oiltank Capacity	Length	Width	Height	Weight
	ton	mm	mm	mm/sn	mm/sn	mm/sn	mm	mm	kw	lt	mm	mm	mm	~ kg
		A	B				C	E			L	W	H	
AD-R 1260	60	1250	1050	200	10	120	160	365	4	100	2490	1285	2375	3500
AD-R 2060	60	2050	1700	200	10	120	265	410	7.5	100	3300	1650	2750	5850
AD-R 2560	60	2550	2200	200	10	120	265	410	7.5	100	3800	1600	2750	7350
AD-R 25100	100	2550	2200	180	10	120	265	410	11	100	3800	1670	2750	8650
AD-R 30100	100	3050	2600	180	10	120	265	410	11	100	4200	1670	2750	9250
AD-R 30135	135	3050	2600	160	10	120	265	410	15	200	4200	1680	2750	10250
AD-R 30175	175	3050	2600	120	10	100	265	410	18.5	200	4250	1700	2750	11250
AD-R 37175	175	3700	3100	120	10	100	265	410	18.5	200	4950	1700	2900	12750
AD-R 40175	175	4050	3600	120	10	100	265	410	18.5	200	5250	1700	2750	12850
AD-R 30220	220	3050	2600	120	10	100	265	410	22	200	4250	1770	2900	12250
AD-R 37220	220	3700	3100	120	10	100	265	410	22	200	4950	1770	2900	14100
AD-R 40220	220	4050	3600	120	10	100	265	410	22	200	5250	1770	2900	14750
AD-R 60220	220	6050	5100	100	10	100	265	410	22	200	7500	1770	3250	20590
AD-R 30320	320	3050	2600	100	10	100	365	410	37	250	4300	1820	3230	17250
AD-R 40320	320	4050	3600	100	10	100	365	410	37	250	5300	1910	3230	20750
AD-R 60320	320	6050	5100	100	10	100	365	410	37	250	7500	1910	3450	28250
AD-R 30400	400	3050	2400	100	8	80	365	510	37	450	3750	2020	3550	22750
AD-R 40400	400	4050	3400	100	8	80	365	510	37	450	5750	2110	3540	26750
AD-R 60400	400	6050	5100	100	8	80	365	510	37	450	7500	2110	3710	35750
AD-R 40600	600	4050	3100	80	7	80	365	510	45	450	5650	3250	3825	40250

2.9 – STANDARD AND OPTIONAL ACCESSORIES OF THE MACHINE

2.8.1 STANDARD ACCESSORIES

- 1 Remote control pedal
- 1 lower, 1 upper tool (These tools can be designed in desired way)
- 2 mold rotating chains and bolts
- 1 illumunator lamp
- Machine user manual
- Manual lower table crowning system
- Back gauge with motor
- Control unit with Modeva 10s software
- Delem da-66w
- Y1-Y2-X-R (4 axes)
- Sheet metal support arms with T- channels and stops

2.8.2 OPTIONAL ACCESSORIES

- Special safety systems and controls having CE certificate
- Lower table crowning system controlled by CNC
- Special design supplementary lower and upper tools
- Manufacturing as Z1-Z2 ; X1-X2 ; R1-R2 ;Z1-Z2-X1-X2-R1-R2 can be realized
- Cybelec Modeva 10s, Delem da-66w touch screen, delem da-69w
- Sheet followe and sliding system ap3-ap4
- Park area for support arms
- DURMA hydraulic upper tool fastening system, for wila tool (without tool)
- Durma hydraulic lower tool fastening system, for wila tool with motor and crowning (without tool)
- Hyd. wila rapid fastening NSCL - II (upper) without tool
- Hyd. wila rapid fastening NSCL - II (lower) without tool
- Mech. basic NSCL wila fastening
- Mech. basic NSCL wila fastening and crowning with motor
- Hydraulic upper fastening for European type tools
- Special throat depth
- Slidable arms
- Laser hardening at tools
- Corner bending with laser measurement
- Lubricant cooler
- Tandem preparation

2.10 – NOISE

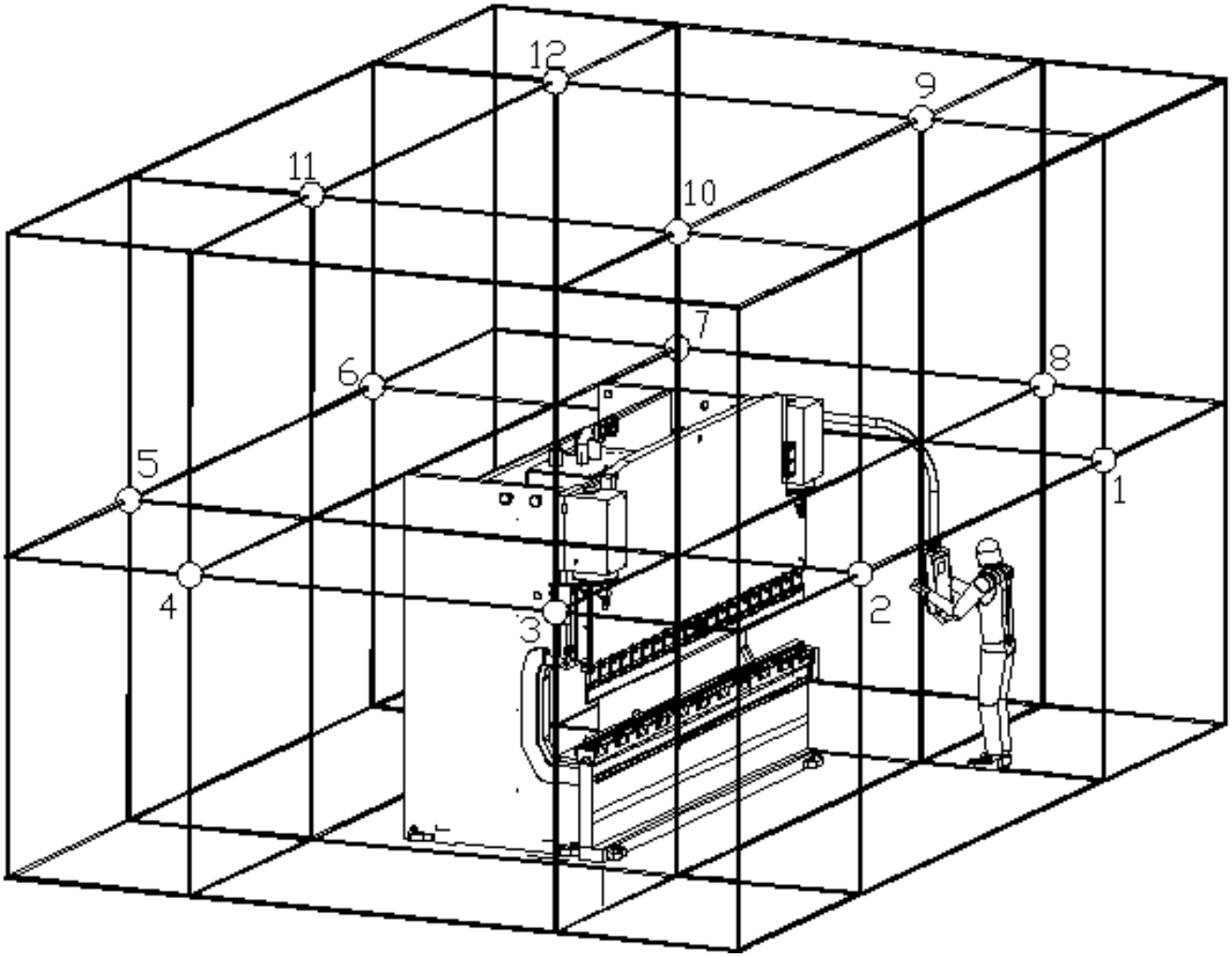


Figure 19

The noise limit of the machine is designed by reducing to minimum levels. Design is made by regarding the following factors:

- The internal pump, geared pump that are being used are the least noise making ones on the market.
- Flexible hoses are isolated from the manifold and the pump assembled on the machine.
- The noises that may occur close to the ear level are prevented by means of making the lateral body high.
- In the case valves are functioning during pressure, hydraulic circuit design is organized neatly for preventing the noise that might be caused by the hydraulic.
- The couplings that were used between the motor and pump are able to absorb the vibration.

2.10.1 – NOISE LEVEL MEASUREMENTS

MACHINE NAME	UNLOADED WORKING (dBA)
60 TON AD-S	70
100 TON AD-S	70
135 TON AD-S	70
175 TON AD-S	70
220 TON AD-S	74
320 TON AD-S	73
400 TON AD-S	74
600 TON AD-S	76

Table 3

NOT: The measurements were made according to EN 12622 press brake standards and appropriate to EN ISO 11202 noise measuring standards.

2.11 – STANDARDS USED IN THE DESIGN OF PRESS BRAKES

STANDARDS	NAME
EN 12622: 2009	Safety of machine tools - Hydraulic press brakes - Safety
EN 292-1.1992	Safety of machinery - Basic concepts, general principles for design. Basic terminology, methodology
EN 292-2:1991	Safety of machinery - Basic concepts, general principles for design. Technical principles and specifications
EN 294:1992	Safety of machinery. Safety distances to prevent danger zones being reached by the upper limbs
EN 349:1993	Safety of machinery. Minimum gaps to avoid crushing of parts of the human body
EN 418:1992	Safety of machinery. Emergency stop equipment, functional aspects. Principles for design
EN 563:1994	Safety of machinery. Temperatures of touchable surfaces. Ergonomics data to establish temperature limit values for hot surfaces
EN 574:1996	Safety of machinery. Two-hand control devices. Functional aspects. Principles for design
EN 614-1:1995	Safety of machinery - Ergonomic design principles - Part 1: Terminology and general principles
EN 894-2:1997	Safety of machinery - Ergonomics requirements for the design of displays and control actuators Part 2: Displays
EN 894-3:2000	Safety of machinery - Ergonomics requirements for the design of displays and control actuators - Part 3: Control actuators
EN 953:1997	Safety of machinery. Guards. General requirements for the design and construction of fixed and movable guards
EN 954-1:1996	The requirements for safety-related parts of control systems – Chapter 1: General principles for design
EN 982:1996	Safety of machinery. Safety requirements for fluid power systems and their components. Hydraulics
EN 983:1996	Safety of machinery. Safety requirements for fluid power systems and their components. Pneumatic
EN 999:1998	Safety of machinery. The positioning of protective equipment in respect of approach speeds of parts of the human body
EN 1050:1993	Safety of machinery - Principles for risk assessment
EN 1088:1995	Safety of machinery - Interlocking devices associated with guards - Principles for design and selection
EN 1837	Integral lighting of machines
prEN 1921:1995	Industrial Automation Systems - Safety of Integrated Manufacture Systems - Main Rules
EN ISO 3746:1995	Acoustics - Determination of sound power levels of noise sources using sound pressure
EN ISO 4871:1996	Acoustics - Declaration and verification of noise emission values of machinery and equipment
ISO 11688-1 :1998	Acoustics - Recommended practice for the design of low-noise machinery and equipment - Part 1: Planning

EN 14122-1 :2001	Safety of machinery. Permanent means of access to machinery. Choice of a fixed means of access between two levels
EN 14122-2 :2001	Safety of machinery - Permanent means of access to machinery - Part 2: Working platforms and walkways
EN14122-3 :2001	Safety of machinery. Permanent means of access to machinery. Stairways, stepladders and guard-rails
EN 60204-1:1997	Safety of Machinery - Electrical Equipment of Machines - Part 1: General Requirements
EN 60529:1991	Specification for degrees of protection provided by enclosures (IP code)
EN 60825-1: 1994	Safety of laser products. Equipment classification, requirements and user's guide
EN 61496-1: 1997	Safety of machinery. Electro-sensitive protective equipment. General requirements and tests

CHAPTER 3 – INSTRUCTIONS ABOUT THE TRANSPORTATION OF THE MACHINE

3.1 - DELIVERY OF THE MACHINE

When the machine is delivered to you, please take the following issues into consideration:

- Be sure that there is no damage during transportation.
- Check if there is any missing part.
- Be sure that the machine or any part of the machine is still functional.
- If the machine is required to be transported again with another vehicle, take care for the placing of the machine with respect to the load balance of the vehicle and take care for the fixing of the machine to the vehicle using wooden wedges so as not to slide.

3.2 - TRANSPORTATION OF THE MACHINE

- The machine is wrapped by nylon folio in order to be effected at minimum level from the environmental conditions during transportation and storing.
- When the machine arrives at the place where it is to be operated or stored, tools like crane, hoist, lifter, etc. should be ready and the region where the machine will be placed should be completed and the environmental conditions of the region where the machine will be placed should be suitable.
- On the concrete where the machine will be installed, there should not be cracks and spaces. The surface of the concrete should be flat. The machine is recommended to be placed on a soft and parallel ground.
- Before bringing the machine to its final position, check the anchorage bolts, be sure these bolts are in the correct place. Balancing bolts should be lubricated and they should be placed on the ground with the whole length.
- There are two lifting points as right and left from the upper points of the lateral bodies (Please look at Figure 20).
- The weight center is in the center of the machine along the X axis and it is variable in the Y axis depending on the rear stop position. Thus, during lifting, this issue is to be taken into consideration.

The issues to be cared for during transportation:

- The lifting apparatus and the connection bridge should be compliant with the loading capacities with the correct specifications.
- While lifting the machine, the correct lifting method should be used and the chain or the steel ropes should have enough strength.
- While transporting the machine from the first unloading region (store, warehouse, etc.) to the region where it is to be used, the weight of the machine should be taken into consideration.
- Do not ever try to lift the machine using the lubricant tank, back basing or the cylinder group. Always use the lifting points.
- If there is not a rope whose lifting capacity is sufficient, the chains and its connections should be compliant with the machine tonnage.
- During lifting, no hanger should be used.

3.3 – REMOVAL OF THE PACKAGE

The machine and the parts thereof are delivered to the customer in packaged form in order for them not to be damaged during transportation. After the delivery of the machine, remove the packages carefully without damaging the machine.

CHAPTER 4 - STORAGE CONDITIONS

The machine is delivered by being taken under protection so as not to be damaged during transportation.
If the machine is to be stored for more than one month, the following issues should be taken into consideration:

- During transportation, the upper tool of the machine is seated onto the V channel of the lower tool. Machine should preserve this position.
- If the machine is to be stored in a humid environment, dehumidifying materials should be placed on the electrical panel and the hydraulic control block, the electrical equipment should be protected from the humidity.
- Protective lubricant should be used in order to prevent the rusting of the lower and the upper tools.
- The machine should be protected from excessive sunlight.
- Storing in open area (in rainy environment) should be avoided. The valve sockets may be damaged or the electrical system may be harmed.

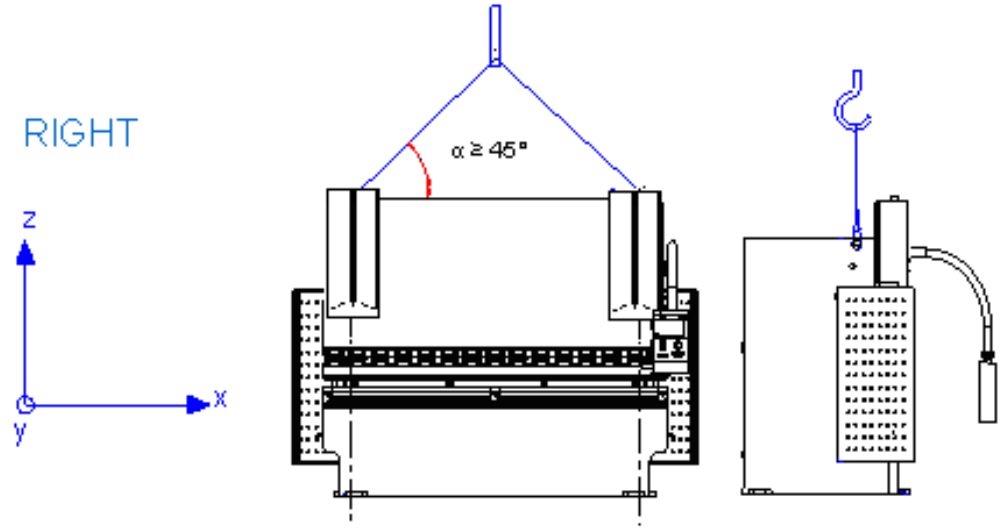


Figure 20

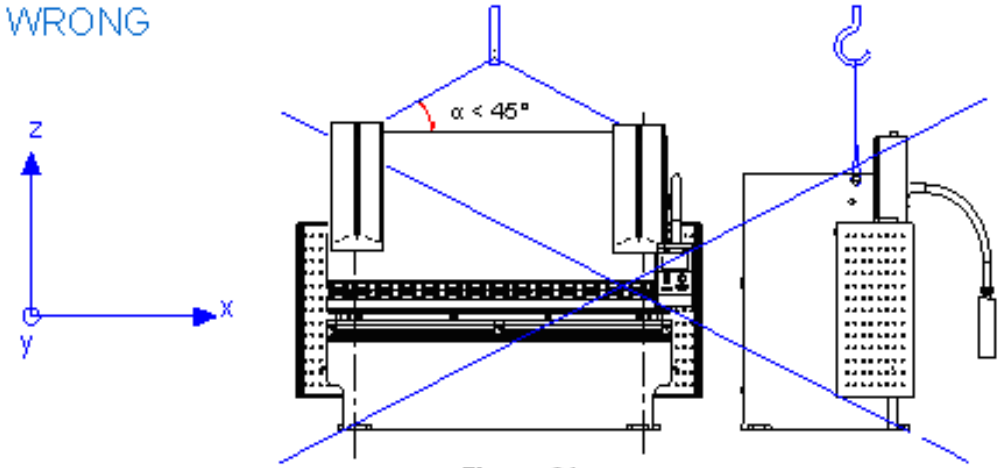


Figure 21

CHAPTER 5 – MACHINE INSTALLATION INSTRUCTIONS

5.1 – GENERAL INFORMATION

As a principle of the company, the customer satisfaction is the most important factor, the strength and the high quality are the most important factors and also the production costs are taken into consideration.

This information is arranged for the careful and efficient transportation of the machines against the damages during loading and unloading.

The most important point is that, for the damages resulting from loading – unloading or for the damages resulting from carelessness, the manufacturer company is not responsible.

Your machine should be commissioned by experts. For the commissioning of your machine, apply DURMAZLAR MAKİNA A.Ş. or the related company (distributor) which you bought your machine from.

5.2 - THE WORKING AREA OF THE MACHINE

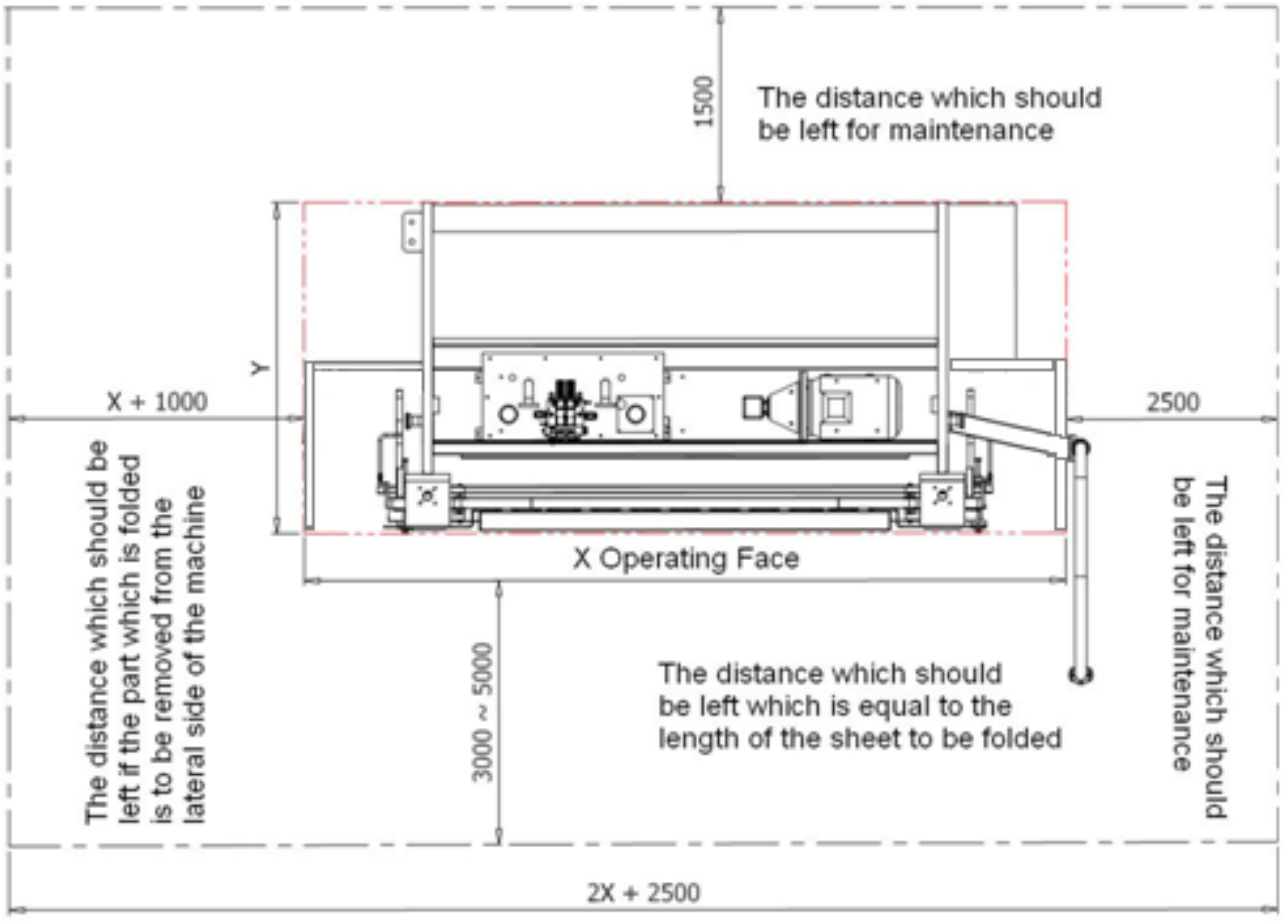

1500
The distance which should be left for maintenance
Y
X + 1000
2500
The distance which should be left if the part which is folded is to be removed from the lateral side of the machine
X Operating Face
The distance which should be left which is equal to the length of the sheet to be folded
3000 ~ 5000
The distance which should be left for maintenance
2X + 2500

Figure 22

5.3 – MACHINE INSTALLATION

A special protective against rusting is applied to the stoned surfaces of the tools. The protective can be easily cleaned by a suitable cleaning substance.

Cleaning process: After wrapping the tools by a wet fabric, wait for 10 minutes and then wipe by means of a clean fabric. Petrol or Tri lubricant solvent should be used.

The connection bolts of the machine to the ground should be supported by metal pieces. The dimensions of these pieces are declared optionally. The machine should be fixed to the ground by anchorage bolts. Before the fixation process, the concrete should be made compliant to the machine. Moreover, using bolts with the required sizes and quality, this process can be realized. The machine should be checked by means of sensitive balance apparatus (water balance). The advised balance points are the center and the two ends of the table. By the placement of the balance apparatus into the center of the table and by balancing on both sides of the table longitudinally, the front-back adjustment and the length adjustment of the machine are realized and the machine is balanced. The balance of the machine is adjusted by the tightening and loosening of the bolts which are placed separately in each leg. **THE BODY OF THE MACHINE SHOULD NOT BE SUBJECTED TO BE TWISTED IN ANY CASE**. In order to provide correct parallelism, the body should not be twisted. Non-parallelism should be eliminated from the support pieces which support the machine and which are parallel to each other (right and left).

5.4 - ELECTRICAL CONNECTIONS

Connect the machine to the main supply by means of standard electrical cables. The machine is arranged with respect to 3 phase main voltage. The cable input is realized through under the electrical panel, the connections to the terminal are realized as in the electrical drawing. Neutral is not used in the powering of the machine. The electrical connections of the machine should be realized by qualified personnel

WARNING: The main supply cable dimensions and the input dimensions should have the values mentioned in the table. These are minimum values and they can be in bigger dimensions depending on the cable length. (Please look at Table 4).

Local (coming to the machine) voltage should be checked by assessing the transformer and the main motor voltage. Connect the suitable powering cable to the machine and power the machine after the checking process.

5.4.1 - MOTOR DIRECTION

The motor direction is from the flange to the pump as mentioned by the arrow. The direction of the motor facing the fan should be checked. In order to determine the motor rotation direction, it should be operated for a short time by means of the Hyd. Pump Start button and afterwards, the motor should be stopped using the Hyd. Pump Stop button. If the rotation direction is wrong, it should be stopped immediately.
In order to change the rotation direction of the motor, the machine should be **COMPLETELY ISOLATED** and the phase coming to the machine should be stopped. This process should be completed by an experienced person. Take the warning label regarding the motor rotation direction into consideration.

5.4.2 - MOTOR POWER SPECIFICATIONS

kW / HP	220-240 V (50Hz/60Hz)			380-400 V (50Hz/60Hz)			415 V (50Hz/60Hz)			440 V (50Hz/60Hz)			575 V (50Hz/60Hz)		
	A	A	q mm²	A	A	q mm²	A	A	q mm²	A	A	q mm²	A	A	q mm²
3 / 4	16	11.5	1.5	10	7	1.5	10	6.5	1.5	10	6	1.5	6	3.5	1.5
4 / 5.5	25	14.5	1.5	16	8.5	1.5	16	8	1.5	16	8	1.5	10	5	1.5
5.5 / 7.5	25	20	4	16	11.5	2.5	16	11	2.5	16	10	2.5	16	8	2.5
7.5 / 10	32	27	6	25	15.5	2.5	25	14	2.5	20	14	2.5	16	10	2.5
11 / 15	50	39	10	32	22	4	32	21	4	32	20	4	25	15	2.5
15 / 20	63	52	16	40	30	6	40	28	6	32	26.5	6	25	20	4
18.5 / 25	80	64	25	50	35	10	50	35	10	40	33	10	40	25	6
22 / 30	80	75	25	63	41	10	50	40	10	50	39	10	40	29	6
30 / 40	125	100	35	80	55	16	63	55	16	63	51.5	16	50	38	10
37 / 50	150	120	50	100	66	25	80	66	25	80	64	25	63	46	16
45 / 60	160	145	70	100	80	25	100	80	25	100	75	25	80	56	16
55 / 75	200	176	95	125	97	35	125	100	35	100	91	35	80	67	25

Table 4

5. 5 - LUBRICANT INFORMATION

5.5.1 HYDRAULIC LUBRICANT SELECTION

Before the machine is installed, the required hydraulic lubricant should be filled until the levels illustrated in the lubricant level display.

(Please look at Table 5)

HYDRAULIC LUBRICANT	IF ENVIRONMENT TEMPERATURE IS LOWER THAN 20°C	IF ENVIRONMENT TEMPERATURE IS BETWEEN 20°C – 40 °C	IF ENVIRONMENT TEMPERATURE IS HIGHER THAN 40°C
Standard norm	Iso Vg 32	Iso Vg 46	Hydro Oil Hd 68
Aral	Vitan Gf 32	Vitan Gf 46	
B.P.	Hlp-Hm 32	Hlp-Hm 46	Hlp-Hm 68
Caltex-Texaco	Rando Oil 32	Rando Oil 46	
Esso	Nuto H 32	Nuto H 46	
Purfina France	Hydran 32	Hydran 46	
Huile Renault-Elf	Olna 32	Olna 46	
Shell	Tellus 32	Tellus 46	Tellus 68
Valvoline	Ultramax 32	Ultramax 46	
Veedol	Andrain 32	Andrain 46	
Yacco	Transhyd 32	Transhyd 46	
Gulf	Harmony 32 Aw	Harmony 46 AW	
Castrol	Aws 32	Aws 46	Hyspin Aws 68
Mobil			Dte 26

Table 5

5.5.2 GREASE LUBRICANT SELECTION FOR LOWER-UPPER SLEDGE

Grease	
Speedol	Epx–2

Table 6

CHAPTER 6 – THE INSTRUCTIONS FOR COMMISSIONING THE MACHINE

6.1 – LATERAL AND FRONTAL PROTECTION COVER ASSEMBLY

Picture 1

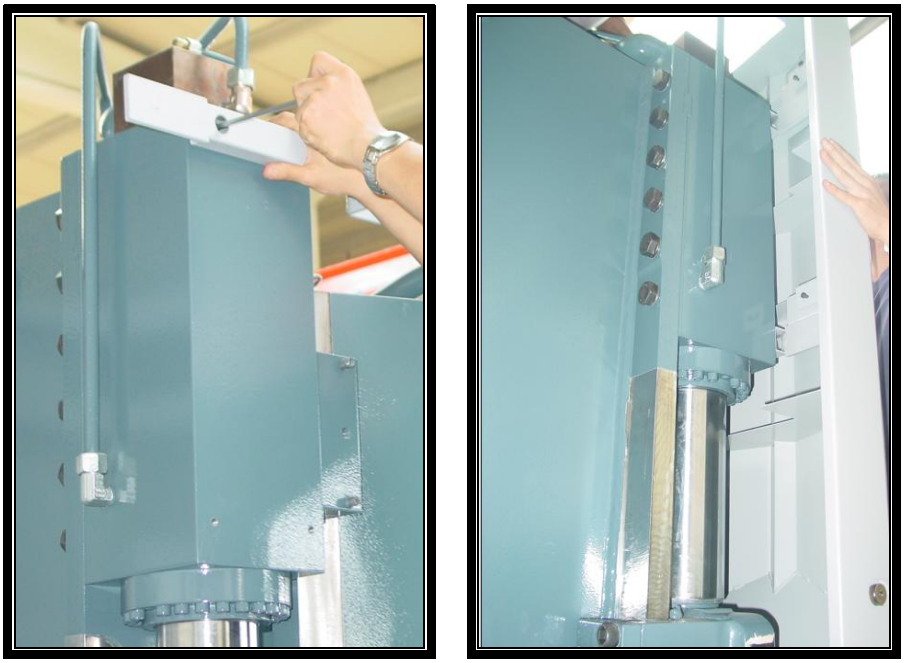
All of the cages and the covers of the machine are designed so as to be coated easily onto the profiles whose assembly is realized on the machine. None of the assembly processes require any connection member except the hinge connections of the lateral cages on the profiles where the lateral cages can be opened.

Picture 2

Picture 3

Picture 4

By means of the bolts, fix the hinges on the fixed cage and the movable door.



Picture 5

In order to fix cylinder casing and middle casing covers; assemble the cylinder casing hanger wedge by screwing to the holes opened beforehand on the cylinder body.
Fix the right and left cylinder casing covers by placing them on the hanger wedges which you fixed beforehand. Fix the right and left cylinder casing covers by means of fixation bolts.
(Please look at Picture 5)

Picture 6

After assembling the opening closing arm on the movable door, the assembly of all of the pieces which are delivered to you in the dismantled form are completed.

CHAPTER 7 – INSTRUCTIONS FOR USE

7.1 – BEND INFORMATION

7.1.1 BENDING IN AIR AND WITH TOOL

Durmazlar Press Brakes are developed in order to shape the sheets. Our press realizes bending in air and bending with tool processes which require sensitivity.

Bending in Air: In this type of bending, there are three important points. These points are the two corners of the lower tool and the bending end of the upper tool. In this operation, the lower and the upper tools do not contact with each other. The process is realized as follows;

First of all, after a suitable " V " channel is selected through the lower tool, the upper tool is displaced and the bending process is continued until the desired value (for instance, 30° , 60° , 75° , ...) is obtained. In this process, the tensioning value of the material should be taken into consideration.

The values which should be taken into consideration in the selected " V " channel:

For sheet up to 3 mm, 6-8 x s

For sheet longer than 3 mm, 8-12 x s

s: This is the sheet thickness to be bended.

From the bending chart on the following pages, the required power, inner radius and similar information can be found.

For instance: For a sheet of 3 mm thickness, the required channel width is 25 mm, the narrowest width of the sheet bended is 18 mm. The inner radius which can be formed is 4.2 mm and the required power for one meter is 21 tones.

For the bend in air, because of the tendency of the material to return its old form, the following tolerance values should be taken into consideration.

- For bending with a blade whose end is sharp ± 2°
- For bending with a standard tool ± 3°
- For bending with a tool whose mouth is wide ±5°

For bending in air, degree differences form resulting from the different values of the material hardness in the whole size. An example regarding this is as follows.

For instance: If we desire to bend a sheet with 2 mm thickness at an angle 140°; the " V " channel aperture to be selected is equal to:

$$V = 8 \times s$$

$$V = 8 \times 2 \Rightarrow V = 16\,\text{mm}.$$

In the next chart, it is equal to 16 mm. The value corresponding to the channel aperture is equal to 0.081. The degree difference for the sheet whose hardness is different is equal to 1°.

If we assume that the hardness difference is equal to 10 % in the whole size oft he material (in this case, 0.20 mm), the degree difference is equal to 2.5°.

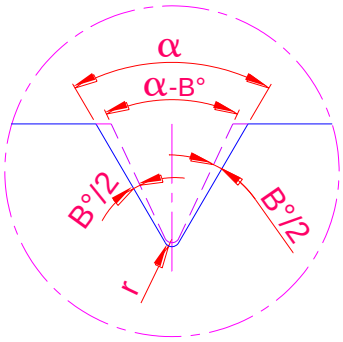


Figure 23

The values we give are possible to be calculated practically or theoretically because of the reasons we explained beforehand. (Please look at Figure 23).

7.1.2 ACCORDING TO DEHLER CHART

MATERIAL	SHEET THICKNESS s (mm)	RADIUS r (mm)	B°
Brass Plate + Aluminum + Copper Rm = 22 daN/mm²	0.8	1s 1s. . . . 5s 5s	4 5 6
	0.8 2	1s 1s. . . . 5s 5s	2 3 4
	2	1s 1s. . . . 5s 5s	0 1 2
Sheet metal plate Rm = 40 daN/mm² + Brass hard plate Rm = 35 daN/mm² + Bronze	0.8	1s 1s. . . . 5s 5s	5 6 8
	0.8. . . . 2	1s 1s. . . . 5s 5s	2 3 5
	2	1s 1s. . . . 5s 5s	0 1 3
sheet metal plate Rm = 60 daN/mm²	0.8	1s 1s. . . . 5s 5s	7 9 12
	0.8. . . . 2	1s 1s. . . . 5s 5s	4 5 7
	2	1s 1s. . . . 5s 5s	2 3 5

Table 7

7.1.3 DIE PRESSING

In order to obtain sensitive profiles, your tools should be very good. Here instead of bending in air, big amount of tonnage usage is required.

Bending with tool: In this type of bending, the upper tool realizes pressing process by displacing until the end of the channel. Here the points to be taken into consideration are;
1 – Requirement to use complete tonnage power of the press,
2 – The opportunity to bend sheets with suitable thicknesses,
3 – Realization of the various bends by means of the same upper blade.

Our advantages in bending are that the degree difference that may occur is at minimum because we decrease the tendency of the material to return to its old form to minimum.
Our disadvantages are the high tonnage usage requirement and high tool cost.

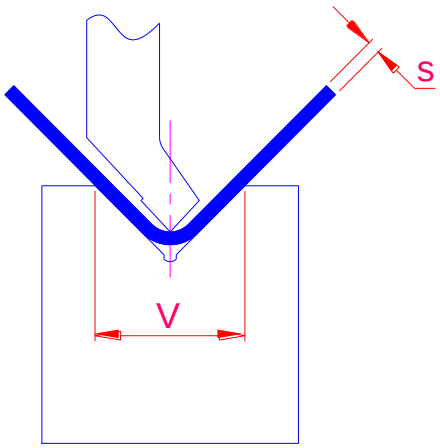
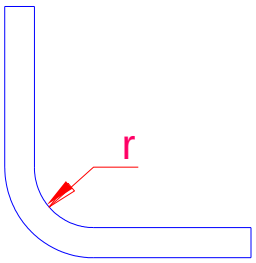


Figure 24

The radius of the sheet to be bended is dependant on the " V " channel aperture, it is not related to the sheet thickness and dimensions. (Please look at Figure 23).
Under these conditions, the radius is smaller than the radius of the " V " channel (Please look at Figure 25).



r = 0.16xV

Figure 25

7.1.4 BACK SPRING PROPERTY

As known, sheets return to their old forms because of their flexibility.

This event depends on the following items:

a – r /s proportion

b – Capacity of the material

c – Upper fibre property of the material

d – The internal structure of the material

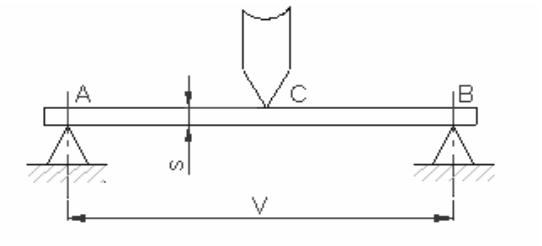


Figure 26

$$F = \frac{1{,}42 \times L \times Rm \times s^2}{1000 \times V}$$

F: Bending Force (ton)

L: Sheet Length (mm)

Rm: The Breaking Off Tension of the Material (daN/mm²)

s: Sheet Thickness (mm)

V: Channel Width (mm)

CHANNEL WIDTH DEPENDANT ON THE SHEET THICKNESS				
Sheet Thickness (s)	0,5 – 2,5	3,0 – 8,0	9,0 – 10,0	12,0 and upper
Channel Width (V)	6 x s	8 x s	10 x s	12 x s

Table 8

MINIMUM SIDE TABLE ACCORDING TO THE ANGLE							
Açı (α)	165 °	135 °	120 °	90 °	60 °	45 °	30 °
Side Length (b)	0,51 x V	0,55 x V	0,58 x V	0,71 x V	1 x V	1,31 x V	1,94 x V

Table 9

FOR INSTANCE:

Sheet length: 1000 mm.

The breaking off tension of the material: 42 daN/mm²

If we choose " V " channel V=8 x s, the value we obtain is as follows.

If $F = \frac{1{,}42 \times 1000 \times 42 \times s^2}{1000 \times 8s}$ ise $F = \frac{1{,}42 \times 42 \times s^2}{8s}$; $F = 8s$.

By means of this formula, without the need for useless calculations, the pressing power (tonnage) which is required for bending in air is calculated.

Length: 2500 mm

Sheet thickness: 2 mm

Hardness of the sheet: 45 daN/mm²

The required pressing power 2,5 x 8 x 2 = 40 tones

As mentioned in the last example, for a sheet with hardness 40–45 kg/mm², the required pressing power to 2.5 mm is given.

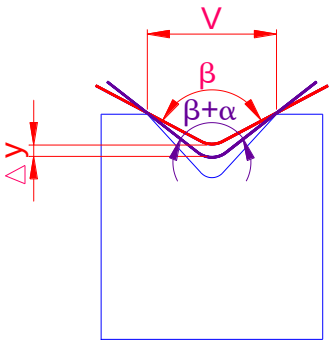
If our press brake is used above its capacity, there may be damages in the tool and in the sheet.

When sheets whose drawing strengths are over 40 kg/mm² are bended, a 10 % value must be added to the practically calculated value. The cracks that may be formed may partially be prevented in this manner.

In harder sheets, this value is taken as 10 – 12 x s and thus the cracks which may be formed as a result of the hardness of the sheet may be prevented.

The following table defines the relationship between Y stroke values, bending angle and back spring. In order to prevent the back spring in the sheet, it must be bended more, where this bending angle increase is equal to α angle. In order to prevent the back spring of the sheet to be bended, more bending must be realized according to the values in the table (Please look at Table 10).

Degree differences which may be formed in a tool whose channel aperture is known.



α = Back spring angle
β = Bending angle

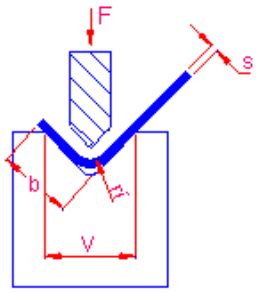
Figure 27

V (mm)	α								
	1 °	1.5 °	2 °	2.5 °	3 °	3.5 °	4 °	4.5 °	5 °
6	0.031	0.046	0.061	0.076	0.09	0.106	0.121	0.136	0.151
8	0.041	0.061	0.081	0.101	0.121	0.141	0.161	0.181	0.201
9.5	0.048	0.072	0.096	0.12	0.144	0.168	0.192	0.215	0.239
10	0.051	0.076	0.101	0.127	0.152	0.177	0.202	0.226	0.251
12	0.061	0.091	0.122	0.152	0.182	0.212	0.242	0.272	0.301
13	0.066	0.1	0.132	0.165	0.197	0.230	0.262	0.294	0.327
15	0.076	0.114	0.152	0.19	0.228	0.265	0.302	0.34	0.377
16	0.081	0.122	0.162	0.203	0.243	0.283	0.323	0.362	0.402
19	0.097	0.145	0.193	0.241	0.288	0.336	0.383	0.43	0.477
20	0.11	0.152	0.203	0.253	0.304	0.354	0.403	0.453	0.502
24	0.122	0.183	0.244	0.304	0.364	0.424	0.484	0.544	0.603
25	0.127	0.19	0.254	0.317	0.379	0.442	0.504	0.566	0.628
30	0.153	0.23	0.305	0.380	0.455	0.53	0.605	0.679	0.754
32	0.163	0.244	0.325	0.405	0.486	0.566	0.645	0.725	0.804
35	0.178	0.267	0.355	0.443	0.53	0.619	0.706	0.793	0.849
38	0.194	0.299	0.386	0.481	0.577	0.672	0.766	0.861	0.955
40	0.204	0.305	0.406	0.507	0.607	0.707	0.807	0.906	1.005
50	0.255	0.381	0.508	0.633	0.759	0.884	1.01	1.132	1.256
52	0.265	0.4	0.53	0.66	0.789	0.919	1.05	1.178	1.306
55	0.28	0.42	0.56	0.7	0.835	0.972	1.109	1.246	1.382
60	0.306	0.46	0.61	0.76	0.911	1.06	1.21	1.36	1.51
63	0.321	0.48	0.64	0.8	0.96	1.11	1.27	1.43	1.58
70	0.357	0.54	0.71	0.89	1.06	1.24	1.41	1.59	1.76
76	0.387	0.58	0.77	0.96	1.15	1.34	1.53	1.72	1.91
80	0.41	0.61	0.81	1.01	1.21	1.42	1.61	1.81	2.01
100	0.509	0.76	1.0	1.27	1.52	1.77	2.02	2.26	2.51
125	0.637	0.95	1.27	1.58	1.9	2.21	2.52	2.83	3.14
160	0.815	1.22	1.62	2.03	2.43	2.83	3.23	3.62	4.02
200	1.02	1.52	2.03	2.53	3.03	3.53	4.03	4.53	5.02
250	1.27	1.9	2.53	3.17	3.8	4.42	5.04	5.66	6.28
320	1.63	2.4	3.25	4.1	4.9	5.7	6.45	7.25	8.04
400	2.03	3	4.01	5.1	6.1	7.1	8.1	9.1	10
500	2.55	3.8	5.01	6.4	7.6	8.8	10.1	11.3	12.6
630	3.2	4.8	6.4	8	9.6	11	12.7	14.3	15.8

Table 10

7.1.5 BENDING DIAGRAM

V	b	ri	s (mm)																				
			0.5	0.8	1	1.2	1.5	1.8	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10	12	15	18	20
6	5	1	2.5	6.5	10																			
8	6	1.3	2	5	8	11																		
10	7	1.7	1.5	4	6	9	13																	
12	9	2		3	5	7	11	16																
15	12	2.7			4	6	9	13	16															
20	15	3.3				4	7	10	12	19														
26	18	4.2					5	7.5	9	14	21													
30	22	5						6.5	8	12	19	24												
32	23	5.4							7.5	11.6	17	23	30											
37	25	5.8								10	14.5	20	26	33										
42	29	6.7									13	17	23	29	33.5									
45	32	7.5										16	21	27	33	48								
50	36	8.3											19	24	30	43	58							
60	43	10												20	25	36	49	64						
70	50	11.5													21	31	42	55	59					
80	57	13.5														27	37	48	60	75				
90	64	15															32	42	54	66	95			
100	71	17																38	48	60	86	134		
130	93	22																	37	46	66	103	149	
180	130	30																		33	48	75	107	133
200	145	33																			43	67	97	119
250	180	42																				54	77	95



$$F = \frac{1{,}42 \times L \times Rm \times s^2}{1000 \times V} (Ton)$$

Table 11

F: Bending force

L: Length (mm) (L = 1000 mm)

ri: Inner radius

Rm: Breaking off strength of the material (daN/mm²)

V: Channel width

b: Minimum sheet curling length

s: Sheet thickness

7.1.6 IMPORTANT NOTICE FOR BENDING

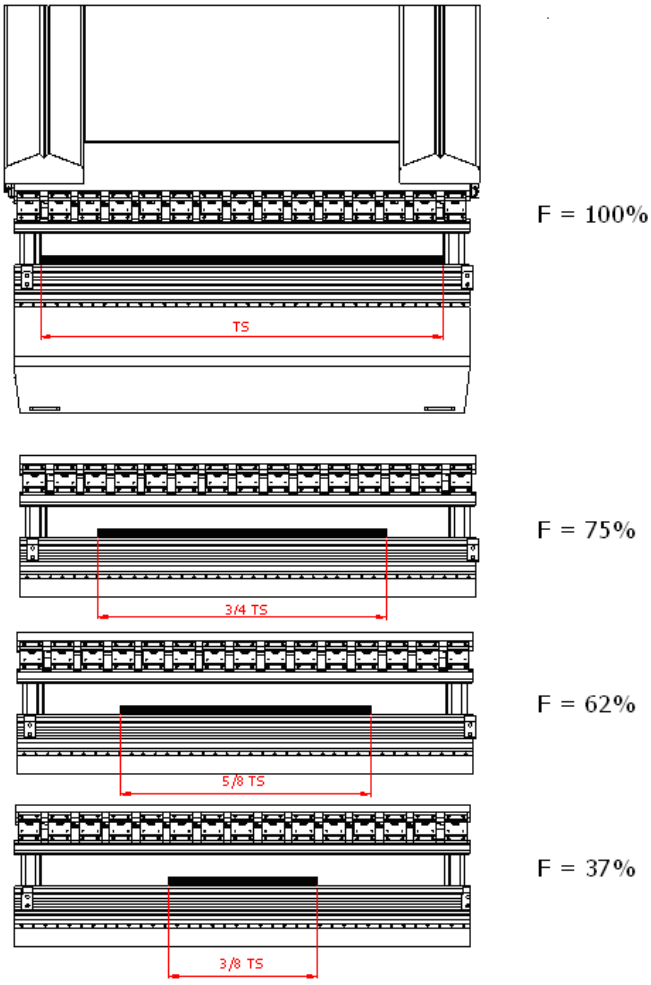


Figure 28

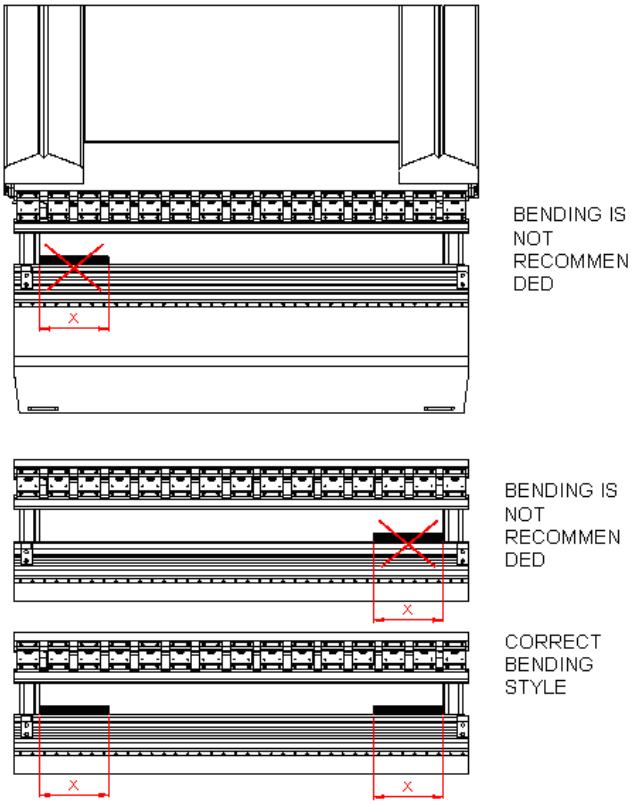


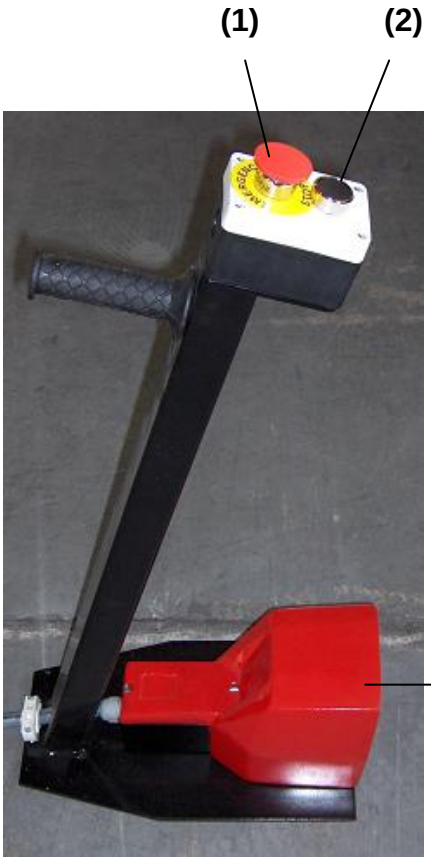
Figure 29

Figure – 28: This is the figure illustrating the maximum tonnage allowed in the determination of the bending length.

TS: Total sheet length

Figure – 29: When we have to realize short bend, as illustrated above in Figure 29, bend pieces with equal lengths on both sides of the machine.

7.2 - OPERATING THE MACHINE



In the machine, command pedal compliant to the CE norms is used.

1) Emergency stop button
2) Lifting up button
3) Pedal

7.2.1 - DELEM DA51 – V4000 – 2 STATIONS

1. Turn on the main switch.
2. Check if the Emergency Stop button on the pedals is in the drawn position or not.
3. Check the Photocell button of the rear stop. The light must be on.
4.

Press the Emergency Restart button.
5.

Bring the Adjust/Auto switch to the Auto position.

6.

Press Hydraulic Pump Start button.

7. Select “Station 1” position from the Station switch.

8. The control unit will be opened on the operation page. If it is not opened on this page, press the button on the right bottom corner of the page.

9. Select the automatic operation mode.

10. In order to operate Da51, press the Start button. The machine will realize the indexing process.

11. In order to adjust V4000, select “1” from the operating modes.

12. Press the Teach-In and Alignment Request buttons together. Press the button for 5 seconds. Teach-In Request lamp will turn on.

13. Press the Teach-In button. The green lamp on the V4000 receiver will turn on.

14. Press the pedal once. The upper mold will displace approximately 100 mm downwardly and it will stop. This is Test 1.

15. Place a small sheet on the lower tool. Press the pedal. The upper tool will displace downwards until the mute point and it will stop again. This is Test 2.

16. Press the pedal again. The machine will realize bending and the upper table will again displace upwardly.

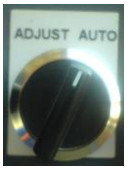
17. The machine is ready for operation.

7.2.2 - MODEVA 880S – PEDAL

1. Turn on the main switch.

2. Check if the Emergency Stop button on the pedals is in the drawn position or not.

3. Wait for the DNC to open. The operation page will appear.

4. 

Bring the Man/Auto switch to the Auto position.

5.

Press the Emergency Restart button.

6.

Press the Hydraulic Pump Start button.

7.
Press the Programming Mode button.

8.

Open the menu by means of the F3 button and open the operation page in the first option.

9.
Press the Stop button if the machine is in the Enc stop mode. Check if the led is turned off.

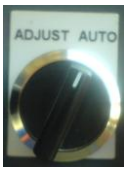
10.
Press the Half Automatic Mode button.

11.
Press the Start button to operate the DNC. Machine will realize indexing.

12. The machine is ready for operation.

7.2.3 - DELEM DA56 – PEDAL

1. Turn on the main switch.
2. Wait for the Delem control unit to be ready.
3. Check if the Emergency Stop button on the pedals is in the drawn position or not.

4. 

Bring the Man/Auto switch to the Auto position.

5.

Press the Emergency Restart button.

6.

Press the Hydraulic Pump Start button.

7. Press the upper table upward button on the pedal. The upper table will take index and it will find the reference point.

8. Press the Half Automatic Mode button.

9. Press the Start button. Rear stop will realize indexing and it will find the reference point.

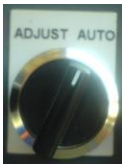
10. Machine is ready for operation.

7.2.4 - MODEVA 880S - LASERSAFE – PEDAL

1. Turn on the main switch.

2. Check if the Emergency Stop button on the pedals is in the drawn position or not.

3. Wait for the DNC to be ready.

4. 

Bring the Man/Auto switch to the Auto position.

5.

Press the Emergency Restart button.

6.

Press the Hydraulic Pump Start button.

7. Press the Programming Mode button.

8.

Open the menu by means of the F3 button and open the operation page in the first choice.

9. Press the Stop button if the machine is in the Enc stop mode. Check if the led is turned off.

10. Press the Half Automatic Mode button.

11. In order to operate the DNC, press the Start button. Machine will realize indexing.

12. Press the pedal. The machine will realize Lasersafe Test1. The upper table will displace downwardly a little and it will stop. Do not press on the pedal. The upper table will return to Tdc.

13. Press the pedal again. The machine will realize Lasersafe Test2. Do not press on the pedal. The upper table will return to TDC.

14.

Press the pedal again, the upper table will displace downwardly and it will complete a normal bend and the upper table will go to Tdc. As the upper table passes through the mute point when displacing downwardly, Muting lamp turns on.

15. Machine is ready for operation.

7.2.5 - DELEM DA56 - LASERSAFE – PEDAL

1. Turn on the main switch.
2. Wait for the Delem control unit to be ready.
3. Check if the Emergency Stop button on the pedals is in the drawn position or not.

4.

Press the Emergency Restart-Reset button.

5.

Press the Hydraulic Pump Start button.

6.

Bring the Man/Auto switch to the Auto position.

7. Select the Half Automatic mode as the operation mode.

8. Press the Start button. Machine will realize indexing.

9. Press the pedal and do not press afterwards.

10. Press the pedal. The machine will realize Lasersafe Test1. The upper table will displace downwardly a little and it will stop. When the pedal is not pressed, the upper table will return to Tdc.

11. Press the pedal again. The machine will realize Lasersafe Test2. When the pedal is not pressed, the upper table will return to Tdc.

12.

Press the pedal again, the upper table will displace downwardly and it will complete a normal twist, the upper table goes to Tdc. As the upper table passes through the mute point when displacing downwardly, Muting lamp turns on.

13. Machine is ready for operation.

7.2.6 - CYBELEC DU6000 - LASERSAFE - – Pedal

1. Turn on the main switch.
2. Wait for the Du 6000 unit to be ready.
3. Check if the Emergency Stop button on the pedals is in the drawn position or not.
4.

From the control panel press the Emergency Restart button.
5. If the DU6000 unit is in the STOP position, press the button and check if the led is turned off.
6.

Press the Hydraulic Pump Start button.
7. Press the Half Automatic Mode button.

8.

Press the Start button. Machine will realize indexing meanwhile.

9. Press the pedal. The machine will realize Lasersafe Test1. The upper table will displace downwardly a little and it will stop. Do not press on the pedal. The upper table will return to Tdc (the top point).

10. Press the pedal again. The machine will realize Lasersafe Test2. Do not press on the pedal. The upper table will return to Tdc.

11. Press the pedal again, the upper table will displace downwardly and it will complete a normal bend and the upper table will go to Tdc.

12. Machine is ready for operation.

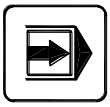
7.2.7 - DNC880s – C4000 – pedal

1. Turn on Main Switch.
2. Check the Emergency Stop button on the pedal (If pressed, release it).
3. Wait for loading DNC.
4. Press the Emergency Restart button.
5. Press Hydraulic Pump Start button.
6. Press the Programming Mode key.
7. Press F3 key to open bending menu and select first line to open “bending page”
8. If ENC is in stop mode then press STOP key. led will be off.
9. Press Semi-Automatic Mode key.
10. Press START to run DNC. Machine will make indexing.
11. Machine is ready for working.

7.2.8 – TURNING OFF THE MACHINE

- For the **Modeva10s/12s/15s and DNC880s** control units,

When you finish operating the machine;

1.  Through the control unit, press the half automatic operating mode button.
2. By pressing on the pedal, bring the upper table to the lowest position (pressing position).
3.

Stop the hydraulic pump motor.

4.

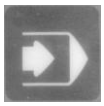
Thorugh the control unit, press the “F1” button and select the “EXIT” option from the opened menu.

5. Wait for the shutting down of the Windows XP operating system.

6. Through the electric panel, bring the main switch to the “OFF” position.

- For **Delem DA-66, Delem DA-69, Delem DA-56, Cybelec DNC60, DU6000 and AD-90** control units;

When you finish operating the machine;

1.  Through the control unit, press the half automatic operating mode button.
2. By pressing on the pedal, bring the upper table to the lowest position (pressing position).
3.

Stop the hydraulic pump motor.
4. Through the electric panel, bring the main switch to the “OFF” position.

CHAPTER 8 – MAINTENANCE, REPAIRMENT AND CLEANING INSTRUCTIONS

8.1 – SAFETY IN THE LOWER and UPPER TOOL ADJUSTMENT

- **! NEVER** place your fingers, hand or any part of your body between the tools.
- Be sure that other people are also far away the tool area.
- When you change the bending adjustments, in order to be sure that the adjustments are correct, be sure that there is no unsafe condition in the trial bending.
- Be sure that all of the equipment is operating correctly and precisely.

8.2 - LOWER and UPPER TOOL ADJUSTMENT

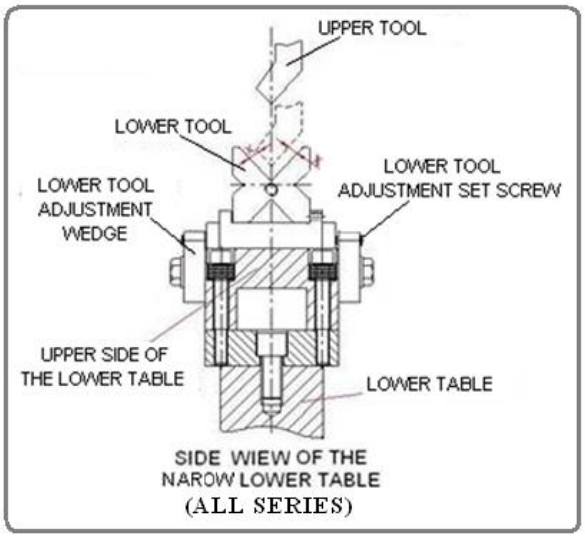


Figure 30

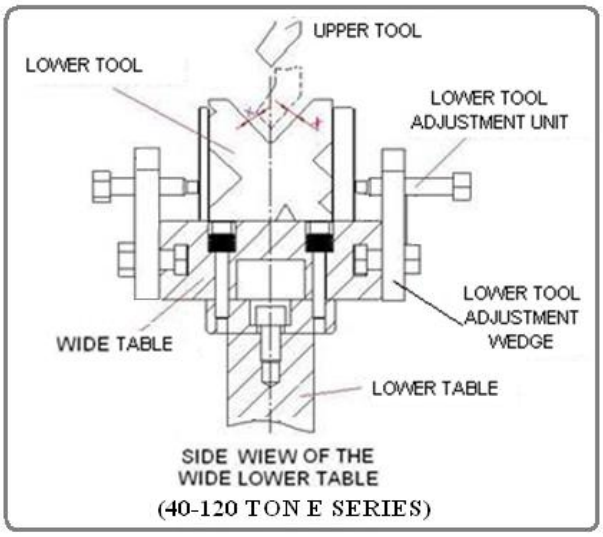


Figure 31.1

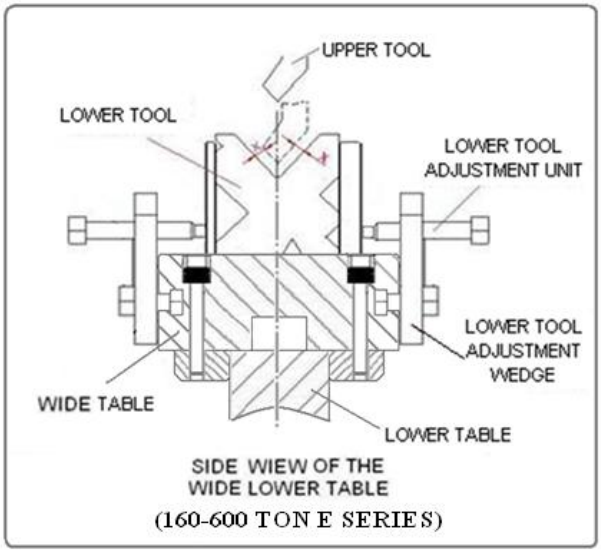


Figure 31.2

The most important factor in order to obtain precise bending is that the lower and the upper tools to be adjusted in the same axis. Adjustment is realized as follows:

- First of all, the lower tool set screws (in the Durma wide connection, tool adjustment handling) are completely loosened.
- The lower surface of the lower tool and the upper surface of the lower table should be cleaned very well.
- The lower tool is seated to its place (by means of tool lifting bolts and chain in the wide connection).
- The “V” channel where adjustment is to be realized and the end of the upper tool should be cleaned well.
- The upper tool (in manual mode) is seated into the “V” bearing of the lower tool in a balanced manner and its centering is provided (by means of a pressure of 10 tones).

- Lower tool adjustment set screws (Tool adjustment handling) are slightly tightened.
- The upper tool is taken 5 – 6 mm upwards.
- Provided that the X distance is equal everywhere, full adjustment is realized by playing with the tightening bolts and tightened by means of composing stick or feeler tool.
- The adjustment process must be realized on both ends of the machine.

8.3 – BACK GAUGE ADJUSTMENT

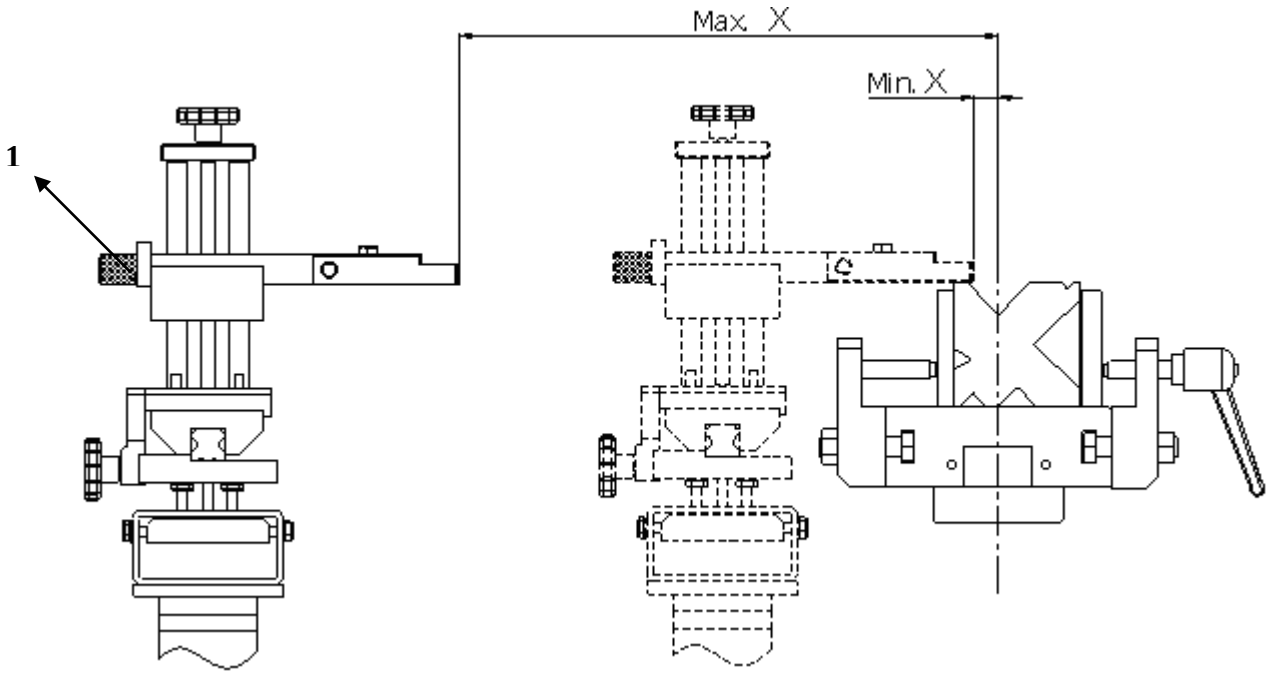


Figure 32

For the safety of the gauge fingers, their displacements on the front and back side are limited by switches. Stop finger sensitive adjustment is provided by the clockwise rotation or the counter clockwise rotation of the special bolt numbered 1.

MACHINE NAME	Max.X (mm)	Min.X (mm)
40 Ton AD-R	430	10
90 – 120 Ton AD-R	620	15
160 – 200 Ton AD-R	620	20
300 – 400 – 600 Ton AD-R	620	25

Table 12

8.3.1 – BACK GAUGE ADJUSTMENT (X,R OPTIONAL)

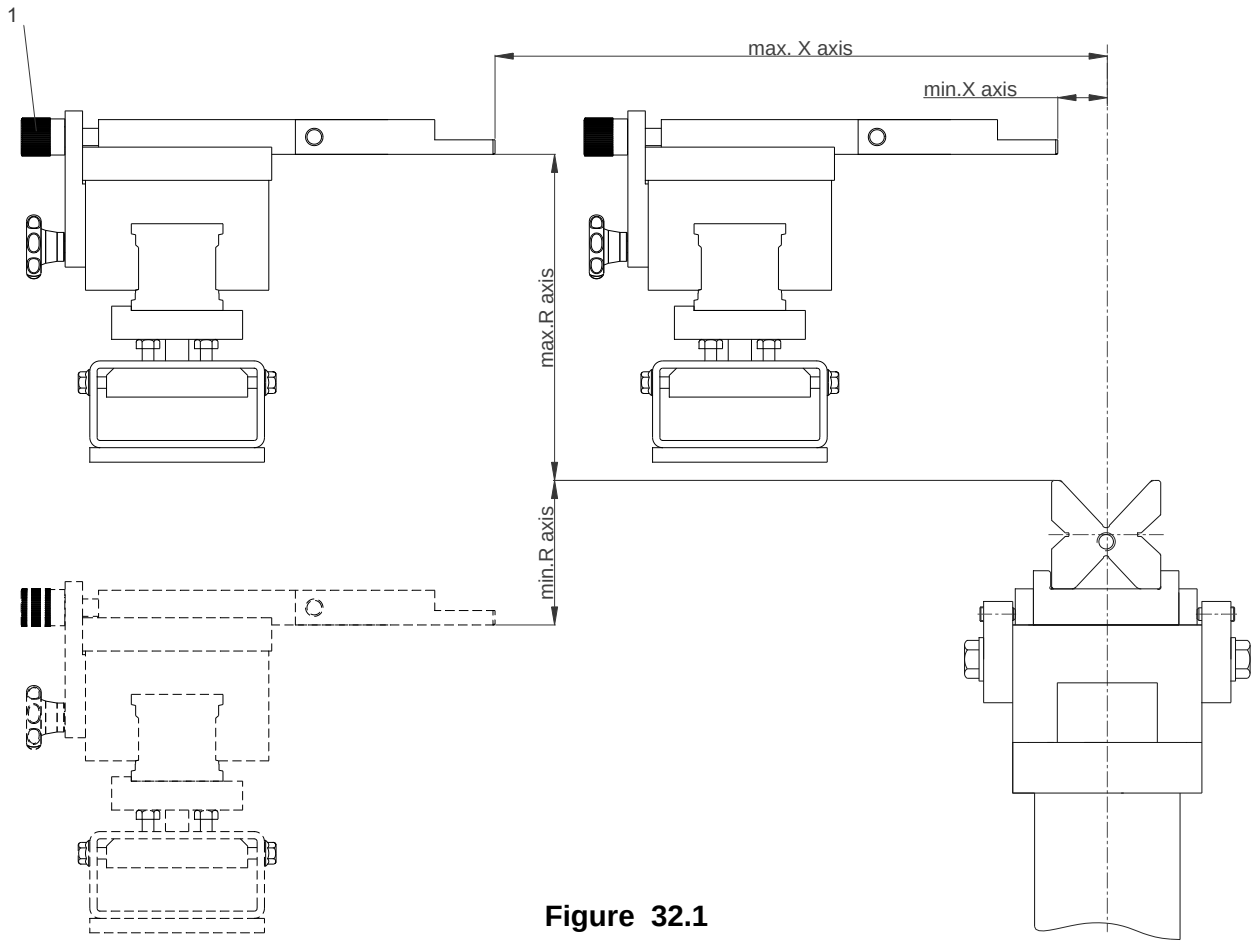


Figure 32.1

For the safety of the gauge fingers, their displacements on the front and back side are limited by switches. Stop finger sensitive adjustment is provided by the clockwise rotation or the counter clockwise rotation of the special bolt numbered 1.

MACHINE NAME	Strok **X (max.)**	Strok **X (min.)**	Strok **R**
40 Ton AD-R	430	0	160
90-120-160-200-300Ton AD-R	650	0	200
400-600 Ton AD-R	750	0	200
AD-R optional	1000	0	200

Table 12.1

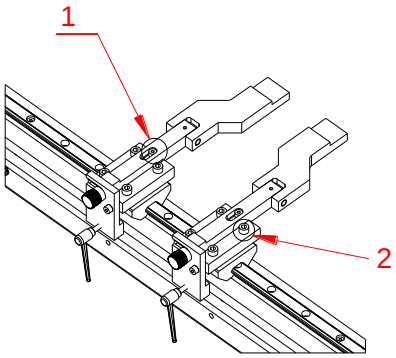


Figure 33

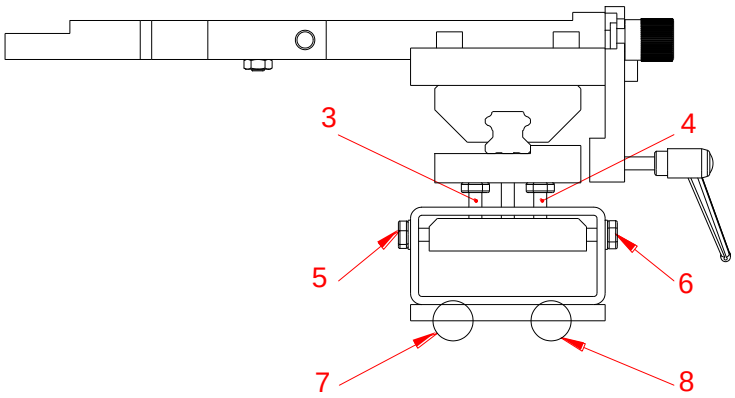


Figure 34

8.3.2 –GAUGE FINGER ADJUSTMENT:

- The bolt (1) in the slot on the gauge finger is loosened. It is fixed just in the middle of the slot by means of the scaled adjustment bolt.
- By loosening the bolts (2) which provide the connection between the gauge finger and gate vehicle, the parallelism of the plane of the finger contacting with the sheet to the lower mold is realized by means of a measurement device or a gauge. By tightening the bolts, the finger is fixed.

8.3.3 - R AXIS ADJUSTMENT:

- R axis deflections in the whole length are determined by placing a gauge on the lower tool and on the gate where the gauge finger are travelling on. This process may be realized by connecting a comparator to the gauge finger and by the travelling of the comparator end along the lower tool upper plane. The known deflections are eliminated by means of R axis adjustment bolts (3, 4).

8.3.4 - X AXIS ADJUSTMENT:

- The deflections in the X axis may be determined by measuring the distance between the front plane of the tool and the fingers by means of measuring devices. If the deflection on two ends of the machine is bigger than 1 mm, it is eliminated by means of bolts (7,8) where the back gauge profile is connected. If the deflection is smaller, it is eliminated by means of adjustment bolts (5,6) on the lateral surfaces of the profile.

8.4 - Y1-Y2 CONNECTION CONTROL

Y1-Y2 connection control is realized when the upper table is in the upper position. While this adjustment is being realized, place a wedge between the lower and the upper table.

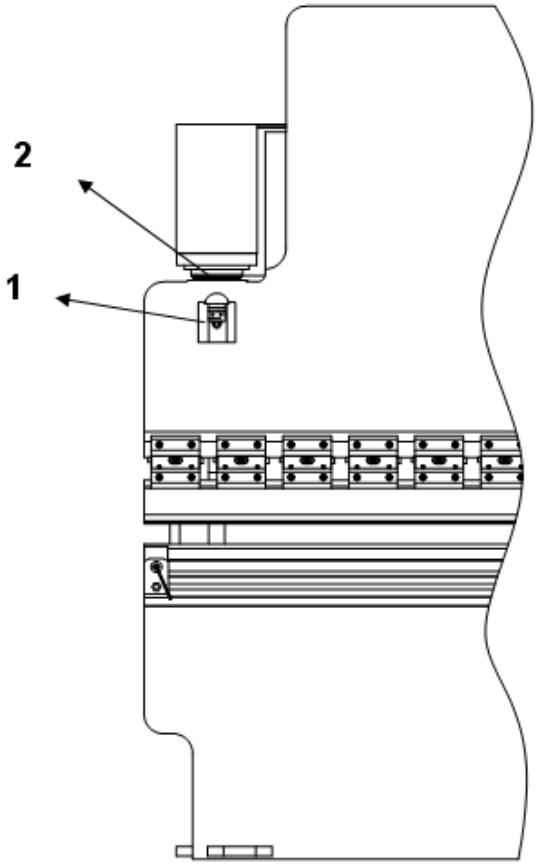


Figure 35

Because of the high pressure and discharge as a result of operation in manual mode, the connections between the upper table and cylinder may loosen.
Because of this, in monthly periods, these connections may need to be checked and adjusted again.

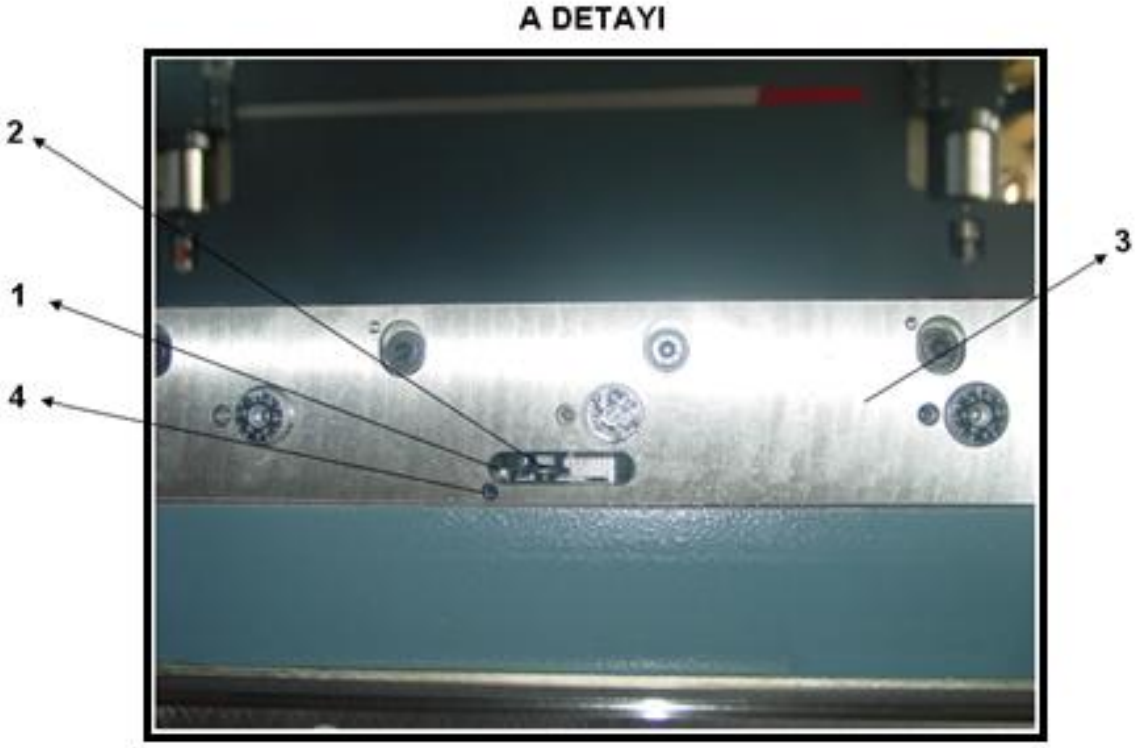
- Upper table and cylinder connection must be realized by following the below mentioned process steps.
- When the upper table is in the upper point, remove the right and left cylinder casing covers on the cylinder.
- Check if the cylinder connection flange (2) is loose or tight.
- If it is loose, the upper table is pressed inside the lower tool with a value equal to half of the maximum tonnage

Afterwards (1) the space of the bolts must be eliminated and they must be tightened one tour. Be sure that both of the cylinder connection bolts are tightened at equal values. Otherwise, the sledge adjustment and the adjustment of the tool axes will change.

- Test the hanger mechanism by displacing the upper table.
- Assemble the covers to their places again.
- Note: During the pressing of the upper table, be sure that the crowning value is zero.

8.5 – HYDRAULIC COMPRESSION SYSTEM

Picture 7



Picture 8

Picture 9

- After the assembly of the Ø12 Pin illustrated by Number 1 and M12 x 35 Special six-corner headed bolt illustrated by Number 2 in Picture 8, the hydraulic compression with Number 3 is placed on the upper table.
- The hydraulic compression is pushed slightly to the right until the centering of the set screw hole with the pin illustrated in Number 1.
- Afterwards, the assembly of the wila motor illustrated by Number 5 is realized and the fixation bolt of the wila motor is dismantled.
- By means of the set screw M5 allen switch illustrated by Number 4, the upper tool is seated onto the lower tool and centering is realized.
- By means of the bolts, the front cover assembly illustrated by Number 6 is realized.
- The ruler is placed to its place.
- The lateral cover illustrated by Number 7 is fixed.

8.6 – MAINTENANCE INFORMATION

- Before maintenance depressurized the hydraulic system. All of the maintenance processes must be realized when the upper table is in the lower point.
- All of the electrical connections should be disconnected before all of the maintenance processes.
- All of the maintenance processes must be realized when the upper table is in the lower point.
- The lubrication points should be lubricated at the frequencies illustrated in the lubrication table (Figure 36) under normal operating conditions.
- If the machine is not to be operated for a long time, the surfaces which have tendency to be rusted should be lubricated with a protective lubricant.
- The oxidized burrs and the pieces which come out of the sheet during sheet bending may corrupt the tools by attaching the lower and the upper tools operating surfaces. Therefore, the burrs must be cleaned regularly.
- The reductors in the rear stop system must be lubricated by means of the lubricant illustrated in Table 14 after 2000 working hours.
- The lubricant used in the hydraulic must be changed after the first 500 working hours and afterwards, after each 2000 working hours. (Please look at Table 5).
- The pressure filter has a sensitivity of 10 microns and with time, it may be filled with the particles in the filter system. The pressure filter has mechanical dirt display. Accordingly, when the display changes from green to red, it must be changed.
- If the machine is not operated continuously, if it is not used for 3 or 5 months and then it s used again, in such a case, the waiting duration of the hydraulic lubricant is taken into consideration. And this leads to a difference according to the mark and type of the lubricant used. In this case, the company which provides the hydraulic lubricant should be contacted and the lubricant used in the machine should be tested. However, the sample lubricant that is to be taken for test from the machine should be taken after the machine is operated for at least 1 hour. The unit that realizes the test examines the standard lubricant characteristics and the sample lubricant values and according to the test result, the unit will declare that this lubricant is appropriate for usage or the unit will declare that the lubricant can not be used. As a result of the test, a ‘NAS’ contamination value is obtained. The NAS value of the lubricant used in the machine should be lower than 9. NAS 7 is a suitable value.
- On the hydraulic unit, the main pressure valve and secondary safety valve are adjusted to the maximum operating conditions in the factory. Do not change these adjustments by no means.
- The hydraulic flexible hoses lifetime about five years. The hydraulic filexible hoses should be changed regularly every five years.

8.7 - INFORMATION ABOUT THE LUBRICANT USED IN THE REDUCTORS

	INDUSTRIAL PLANTS ISO standard .. EP grade		
T_a	-10°C / +30°C	+10°C / +45°C	-20°C / +60°C
	ISO VG 150	**ISO VG 220**	**ISO VG 150-220**
AGIP	BLASIA150	BLASIA 220	BLASIA SX 220
ARAL	DEGOL BG 150	DEGOL BG 220	DEGOL PAS 150-220
BP	ENERGOL GR XP 150	ENERGOL GR XP 220	EVERSYN EXP 150-220
CASTROL	ALPHA SP 150	ALPHA SP 220	ALPHASYN EP 150-220
CEPSA	ENGRANAJES HP 150	ENGRANAJES HP 220	ENGRANAJES HPX 150-220
CHEVRON	N.L. GEAR COMPOUNDS EP 150	N.L. GEAR COMPOUNDS EP 220	TEGRA SYNTHETIC GEAR EP 150-220
ESSO	SPARTAN EP 150	SPARTAN EP 220	SPARTAN S EP 150-220
FUCHS	RENOLIN CKC 150	RENOLIN CKC 220	RENOLIN UNISYN CKC 150-220
KLUBER	KLUBEROIL GEM1-150	KLUBEROIL GEM1-220	KLUBERSYNT EG 4-150 / 4-220
Q8	GOYA 150	GOYA 220	EL GRECO 220
MOBIL	MOBILGEAR 600 XP 150	MOBILGEAR 600 XP 220	MOBILGEAR SHC XMP 150-220
MOLYCOTE	L-0115	L-0122	L-2115 / L-2122
REPSOL	SUPER TAURO 150	SUPER TAURO 220	SUPER TAURO SINTETICO 150-220
SHELL	OMALA EP150	OMALA EP220	TIVELA OIL S
TOTAL	CARTER EP 1500	CARTER EP 2200	CARTER SH 150-220

NOTE: Below –30° and above +60°, special felt should be used

Table 13

8.8 – MACHINE LUBRICATION SCHEMA

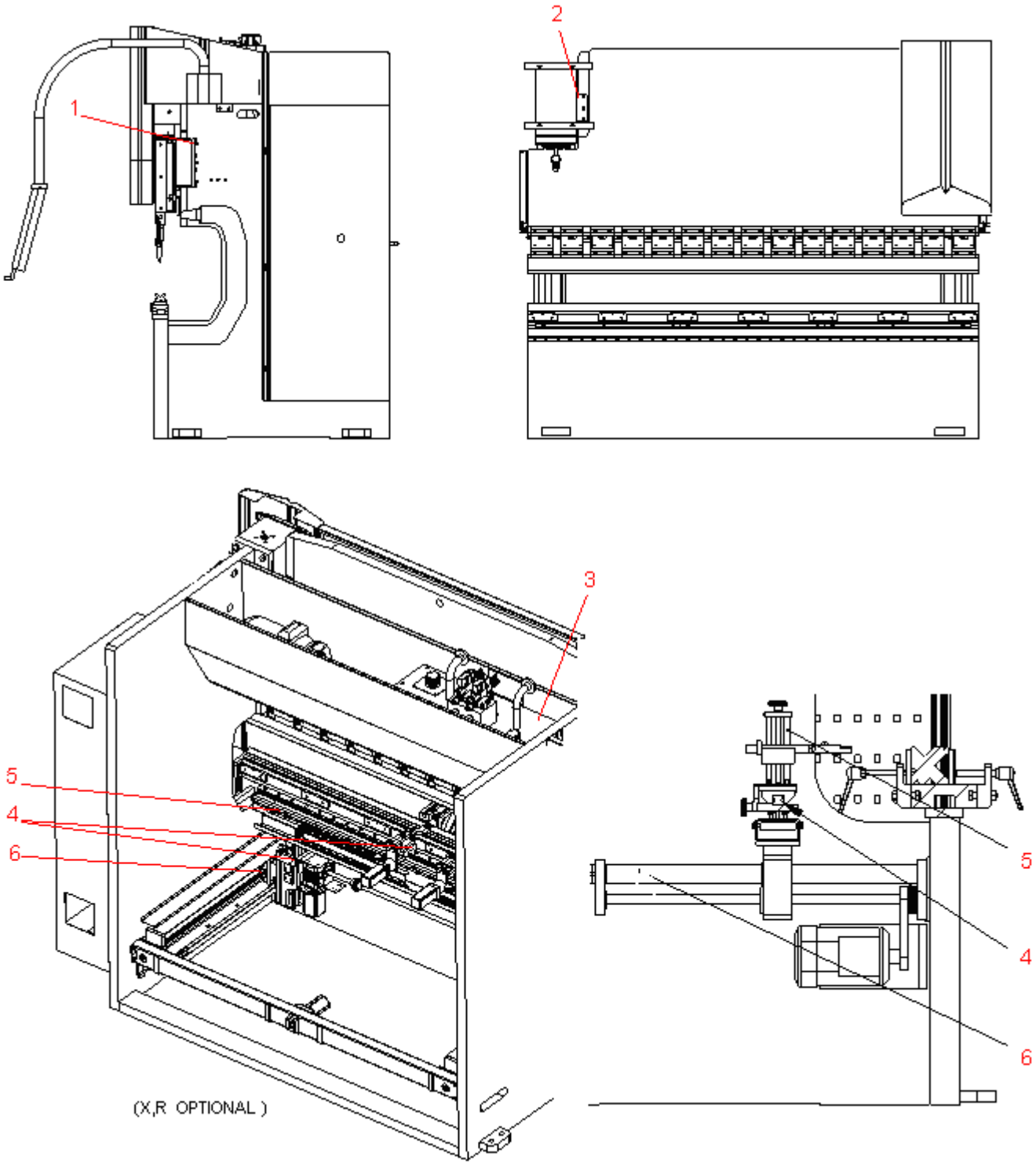


Figure 36

NO	NUMBER	ITS LOCATION IN THE MACHINE	FREQUENCY	LUBRICANT TYPE
1	4	Lower Sledge	Once in a week	Speedol Epx–2
2	4	Upper Sledge	Once in a week	Speedol Epx–2
3	2	X Axis Ballscrew Nut	Once in a week	Speedol Epx–2
4	6	Gate Vehicles	Once in a week	Speedol Epx–2
5	3	Rear stop Rack Gear	Once in a week	Speedol Epx–2
6	1	Hydraulic reservoir	As the lubricant level decreases	Iso Vg32 – Vg 46

Table 14

8.9 - HYDRAULIC RESERVOIR LUBRICANT LEVEL DISPLAY

The hydraulic reservoir lubricant level display which is used at the same time as a thermometer should be filled with lubricant until the 100° C line. When the lubricant level falls below the 40° C line, lubricant addition to the hydraulic reservoir should certainly be realized

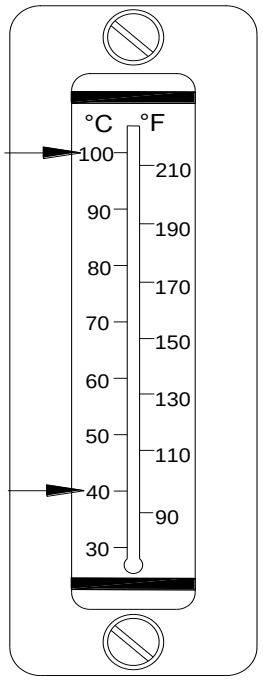


Figure 37

8.10 - REAR LIGHT CURTAIN TEST

The protective device must be checked daily or prior to the start of work by a specialist or by authorised personnel, using the correct test rod.

Operate the machine if the power LED and guard LED are lit. In another LED combinations during the test do not operate the machine.

Installation of the multiple light beam safety device must be checked by specialised personnel. In operation mod power and guard LED must be light up. During the test if the situation of the LEDs does not change when the specialized personnel interrupted the multiple light beams, work must stop at the machine.

This must produce the following result:

On the transceiver for the related multiple light beam safety device only the power LED, break LED and upper LED are allowed to illuminate and not the other LED combinations and as long as the light beam is interrupted, it must not be possible to initiate the dangerous state

CHAPTER 9 - TROBLESHOOTING INFORMATION

9.1 – POSSIBLE FAILURES

- ***If one of the machine cylinders deflects downward;***

For machines with REXROTH block:

1. The places of the secondary safety valves (Please look at the Hydraulic circuit scheme) are changed. If the problem passes to the other axis, this shows that the problem is in the secondary safety valve whose place is changed.
2. After the place changing process, if the problem still continues, the places of the opposite pressure valves on the hydraulic block are changed. If the problem passes to the other axis, this shows that the problem is in the opposite pressure valve whose place is changed.
3. After the position changing of the opposite pressure valves, if the problem continues, the places of the direction valves are changed. If the problem passes to the other axis, this shows that the problem is in the direction valve whose position is changed.

- ***When the pedal is pressed and the upper table is displacing downwardly, if one cylinder is displacing downwardly faster than the other cylinder;***

1. The machine is balanced.
2. The sledge adjustment of the machine is realized.

- ***While the machine is realizing indexing, if it does not complete the reference process;***

The arrow symbol on the linear ruler body must be at a lower position than the arrow symbol on the movable part. If the arrow symbol is not at a lower position, the bolts between the cylinders and the upper table may loosen. These bolts must be tightened.

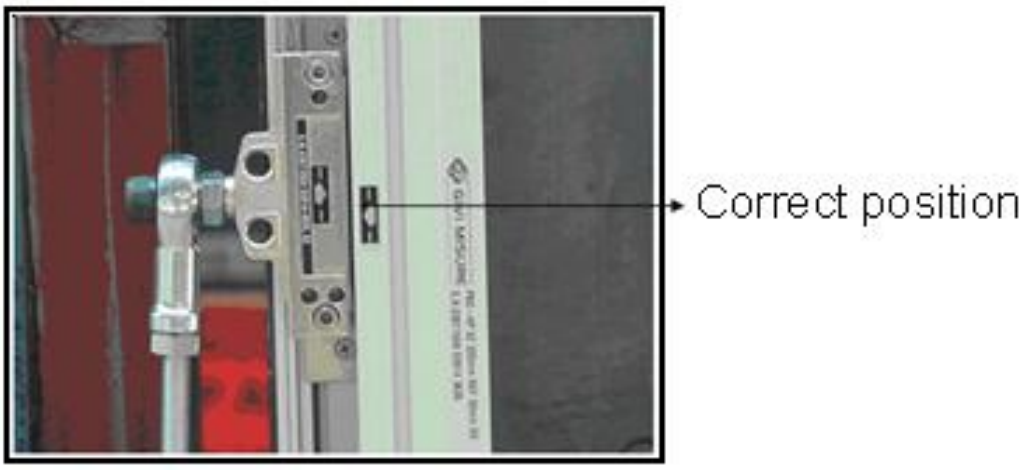


Figure 10

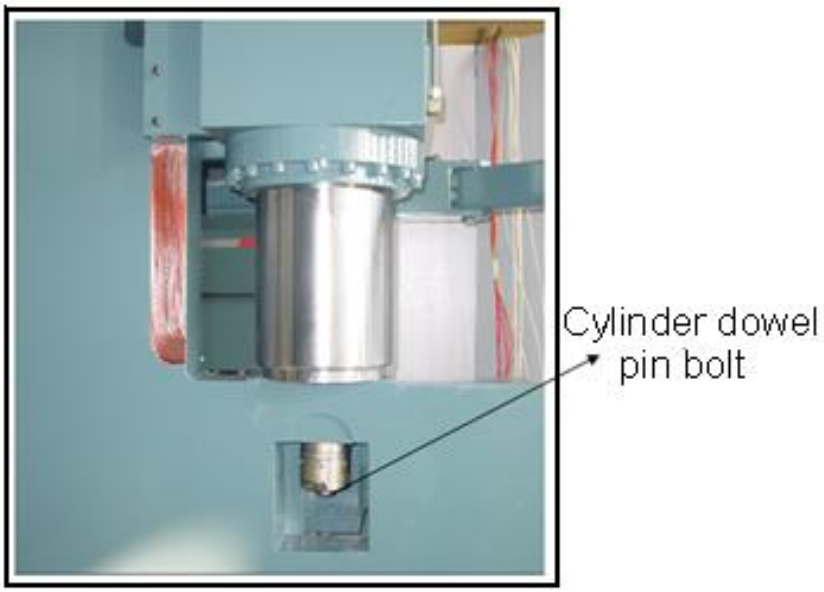


Figure 11

- ***If there is no displacement on the upper table when the pedal is pressed;***

1. First of all, it is checked if the machine takes reference or not.
2. Afterwards, the energizing of the contacts are checked, in other words, when the pedal is pressed, it is checked if the contacts of the contacts in double hand circuit draw or not.
3. When the pedal is pressed whether the contacts of the contactor draw and whether power reaches to the servo valve, fast dropping valve and common valves are measured by means of a measurement device by examining the voltage level of the valves.

- ***If there is no displacement in Y1 or Y2 axes when the pedal is pressed***

1. It is checked if the position values of Y1 and Y2 in the control unit are equal or not.
2. It is checked if linear encoder operates or not.
3. The places of the direction valves are changed. If the fault passes to the other axis, this shows that the fault is in the direction valve.
4. If the problem continues, it is checked from the control unit that all of the axes are in the position or not.

- ***If the machine does not pass to pressing mode;***

1. First of all, the upper table of the machine is taken to the upper point.
2. The cover of the hydraulic reservoir is opened. The control unit is prepared in manual operation mode and the pedal is pressed.
3. The inside of the hydraulic lubricant reservoir is checked by hand, if lubricant comes out of the thick pipes extending from the hydraulic reservoir towards the front filling valves, then this shows that the filling valve of that axis is faulty.

- ***If the upper table of the machine have difficulty in the returning process in the end of pressing process;***

1. For the CYBELEC control unit, by means of the parameter numbered 33 from the machine parameters page, the lifting upwardly pressure values are increased.
2. For the DELEM control unit, the parameter numbered 59 from the Y-axis parameters page is increased as percentile value.

9.2 – ADJUSTMENT OF THE Y1 and Y2 AXES IN THE PRESS BRAKE WITH CYBELEC DNC UNIT

This adjustment is realized in order to eliminate the difference between the two ends as a result of the bending obtained by the material which we realize most of the bending processes and by the TOOLS used in the bending of this material and when we can not obtain the value which we write in the DNC. For this:

1. A material which is equal in length to at least 2/3 of the machine length is bended 90° in the machine. By means of a setsquare with degrees, the angles in the direction of the Y1 and Y2 cylinders are measured.
2. In the DNC unit, the switch is turned to the “3” (while pressing the Alt button, press the 3 button) position. As password “333” is entered.
3. Programming key is pressed. Program mode is selected.
4. Using the PgUp and PgDwn buttons in the parameters, the UPPER TABLE (BEAM) page is selected.
5. On the UPPER TABLE (BEAM) page, the 09. Index line is found.

FOR INSTANCE:

.

.

07. Limits Min _____ Max _____
08. Ref. In pressure Y1 _____ Y2 _____
09. Index Y1 ###,## mm Y2 ###,## mm
Y1 ###,## mm Y2 ###,## mm
10. **.....**

.

.

6. In the bending test realized, on the (Left) Y1 side, if we obtain 92° instead of 90°, in the 09.Index line, Y1 value is incremented. If we obtain 88° instead of 90°, in the 09. Index line, Y1 value is decreased. The same rule applies for the Y2 (Right) side.

7. After the required arrangement is realized, in DNC, the switch is taken to the “0” (while pressing the Alt button, press the 0 button) position. The machine is normally turned off. Afterwards, it is turned on again and index is taken by the machine. The bending process is checked by realizing bending by the machine. Again if there is a difference, with the same method, again an arrangement is realized.

9.3 – ADJUSTMENT OF THE Y1 and Y2 AXES IN THE CNC PRESS BRAKE WITH DELEM DA 66 UNIT

This adjustment is realized in order to eliminate the difference between the two ends as a result of the bending obtained by the material which we realize the most bending processes and by the tools used in the bending of this material and when we can not obtain the value which we write in the DNC. For this:

1. A material which is equal in length to at least 2/3 of the machine length is bended 90° in the machine. By means of a setsquare with degrees on it, the angles in the direction of the Y1 and Y2 cylinders are measured.

2. In the DNC unit, the menu button is pressed.

3. On the menu page, firstly code ‘19’ is entered. Afterwards, the enterance code ‘ 32157 ‘ is entered.

4. In the menu that appears, 1 – Y and X axis machine parameters is selected and parameter page is entered.

5. In the parameters, 5 – lin. Scale Ref. Left and 6 – lin. Scale Ref. Right lines are found.

6. In the test bending realized, if we obtain on the Y1 (Left) side 90° instead of 92°, 5 – lin. Scale Ref. Left value is decreased.
If we obtain 88° instead of 90°, 6 – lin. Scale Ref. Right value is increased.
The same rule may be applied for Y2 (Right) side.

NOTE: The amount in increasing and decreasing process is determined by finding the amount formed in Y1 and Y2 values when 1° Correction is given in DNC.

7. After the required arrangement is realized, END button is pressed twice in DNC. The pump is closed. END button is pressed again and it is waited for 30 seconds. The pump is operated after the screen appears in DNC and indexes are taken by the machine. The bending process is checked by realizing bending by the machine. Again if there is a difference, with the same method, again an arrangement is realized.

9.4 –CROWNING SYSTEM

CROWNING SYSTEM

The arm on the right of the machine in the crowning system is adjusted to 0 in our factory.
The ridge increases if the turning arm is rotated counter-clockwise (towards left). The ridge decreases if it is rotated clockwise (towards right).
SIKO numarator must be operated between values 0 – 100. For the values between 0 – 100, in 0, a ridge of 0 mm and in 100 (for a length of 3 meters), a ridge of 3 mm is formed in the middle. With respect to various sheet thicknesses, the user must find the most suitable crowning value by applying it himself.
The dimension between the lower and the upper points of the crock springs in the connection bolts of the crowning system is as mentioned in the table. This value is adjusted according to the values between 0 – 100. The table values must be checked in periodical maintenances.

ATTENTION:

During transportation, the turning arm is dismantled in order not to be damaged. When the machine is commissioned, the arm must be placed into its slot and the set screw must be aligned with the hole on the numerator spindle and it must be tightened. Thus, the arm is fixed.
While there is pressure in the machine, do not realize adjustment. This may lead to a breakage in the piece.
When the crowning is 0, the adjustment must be realized as follows;

A Tabla boyu	B 1 bolt parca	B 2 bolt parca	B 3 bolt parca	B 4 bolt parca	B 5 bolt parca	Bağlantı Parcası ADET
2550	-	-	13.6	13.5	13.4	10
3050	-	-	13.6	13.5	13.4	10
3550	-	-	13.6	13.5	13.4	12
3700	-	-	13.6	13.5	13.4	12
4050	-	13.7	13.6	13.5	13.4	14
6050	13.8	13.7	13.6	13.5	13.4	20

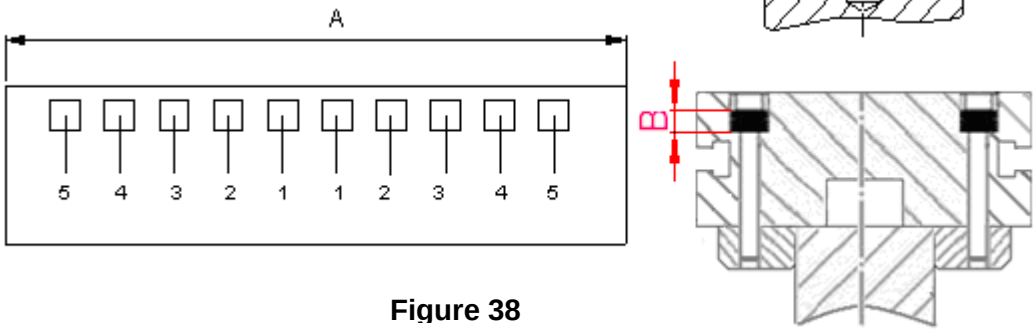


Figure 38

NOTE: Do not intervene with the crowning. If there is a problem, consult the authorized service.

CHAPTER 10 – THE HEALTH AND THE SAFETY OF THE OPERATOR

10.1 – THE SPECIFICATIONS OF THE HYDRAULIC LUBRICANT USED

Blazing point (°C) and the method: 193° C closed reservoir

Combustion temperature (°C): > 200

Fast burning limit: 1.5 – 6

The units formed as a result of burning: Essentially carbon-oxides, the organic compounds defined by water vapor

Special burning / Dangerous explosions: On wide surface areas where air or oxygen are existing freely, the greasy wastes, papers may easily lead to combustion. These materials should be disposed after usage.

Special extinguishing methods: The extinguishing stuff should come to the related region with equipment that provides breathing. Directly applying water to the stored containers is dangerous because of the boiling risk.

Fire extinguishers: Foam, dry chemical powder, carbon dioxide.

Appropriate materials / layers : All of the general metals

Inappropriate materials / layers : It may melt some plastics

Continuity : Permanent

Reaction with water : No

Dangerous reactions : No

The materials that have to be kept away: The units that strongly oxidize other units

The conditions that have to be kept away: High temperature

Decomposition temperature (°C) : > 100

Dangerous decomposed products : There is no composition of harmful decomposed products.

Storing temperature (°C) : 0 - 40

Storing precautions : There is no special requirement. The factor that has to be kept away is the increasing temperature.

TRANSPORTATION

- Technical precautions

. Protection of the user: Provide appropriate ventilation in order to prevent the product being subject to the vapor or smoke thereof.

Avoid contact with used or dirty products.

Keep the machine away from the flammable materials.

Keep the machine away from comestibles.

. Protection from fire and explosion: Empty tankers may comprise explosive gas and vapors. After the pouring of the product, the cloth, paper and other similar materials used in the collection of the product are flammable.

These should not accumulated, and after being used, they should be disposed of safely and immediately.

- Precautions: Avoid the static electrification of the product, provide connection with the ground.

Realize the machine adjustments so that the product does not pour on the hot pieces or the electrical equipment.
Prevent leakage to the circuit operating under pressure. The liquid which comes out as a result of the leakage to this circuit is distributed by spraying and it is flammable. In this case, the lubricant vapor reaches the burning lower point in the concentration of 45 g/m^3.
During usage, nothing should be eaten, nothing should be drunk and cigarette should not be smoked.
- Transportation recommendations: Only reservoirs, gasket, pipe, etc resistant to hydro-carbon should be used.

STORING:

- .Technical precautions: Realize the necessary arrangements and take all the necessary measures in order to prevent the product to mix into the water and the soil.
- Storing conditions
. The appropriate method: Store in room temperature, keep away from water and humidity, keep away from flame sources.
Keep the carriers closed when they are not used.
. The factors that need to be avoided: Do not store the materials that have been subject to the product (cloth, paper, etc.)
- Inappropriate products: It leads to a dangerous reaction with strong oxidants.
- The packaging of the product
. Recommended: Only reservoirs, gasket, pipe, etc resistant to hydro-carbon should be used.
If possible keep it in its original carrier.
Otherwise, place all the markings onto the new carrier according to the original carrier.

Identification of the dangers
- Harmful for the human health: Under normal usage, it does not have any effect or danger.
- Environmental effects: Do not pour this product into the environment.
- Physical and chemical: Under normal usage, it does not have a special burning or explosion risk.

10.2 – THE RECOMMENDED FIRST AID

IN CASE OF A SERIOUS DISTURBANCE, A DOCTOR SHOULD BE CALLED OR THE PERSON SHOULD GO TO A MEDICAL ESTABLISHMENT.

- Respiration: When a person is subject to the vapor or the spray of the product in dense form, this may lead to a light irritation in the throat of the person.
The person should be taken outside, he/she should have a rest in a warm environment.
- Contact with the skin: When the skin is subject to product spray in high pressure, the product may penetrate under the skin. The person who is subject to these conditions should be taken to the hospital even if there is no wound or visible sign on the skin.
The clothes of the person which are subject to the product should be peeled off immediately.
The part which is subject to the product should be washed with water and soap immediately and in a repeated manner.
- Contact with the eye: With the eyes open, they should be washed with plenty of water for 15 minutes immediately.
- Swallowing: There is a risk of vomiting and diarrhea.
The person should not be vomited because of the risk of contact with the respiration system.
Nothing should be drunk to the sick person.

- Suction: If the product is thought to go inside the lungs because of any reason (for instance because of vomiting), the person should be immediately taken to the emergency service of the hospital.

Control of the usage / individual protection

- Engineering precautions: The product should only be used in well ventilated places.
When using the product in closed areas, be sure that there is no dense vapor effect in the air or put on / fix the recommended equipment.
- Control parameters
- The limit to be subject to: lubricant vapor: 10 mg/m^3 for 15 minutes
lubricant vapor: 5 mg/m^3 for 8 hours
Individual protection equipment
- Hand protection: Water-proof gloves which are resistant to hydro-carbon.
The recommended material: rubber.
- Eye protection: Eye-glasses against splashes.
- Skin and the body: When necessary, mask for face protection, clothes resistant to hydro-carbon, safety boots (when carried by means of barrel)

Toxic information

STRONG TOXIC / LOCAL EFFECTS
- Respiration: It does not have a risk in normal usage.
In respiration, according to the concentration of the vapor, it may lead to a light irritation in the upper part of the respiration system.
- Contact with the skin: It does not have a risk in normal usage
When the skin is subject to product spray in high pressure, the product may penetrate under the skin. The person who is subject to these conditions should be taken to the hospital even if there is no wound or visible sign on the skin.
- Swallowing: If it is swallowed in small amounts, there is no risk. In case that large amounts are swallowed, it may lead to an ache in the abdomen and to diarrhea.
SENSITIVITY: Under the light of the known information, the product does not lead to sensitivity.
CHRONIC AND LONG-TERM TOXIC EFFECT
- Contact with the skin: In case of long-term or continuous contact with the clothes where the product is smeared, characteristic skin wounds (oily pimples) may form.

Annihilation information

Annihilation of the wastes: Recycling and the re-using of the waste lubricants are essential. In cases where this is not possible, the waste lubricants should be annihilated without giving harm to human health and to environment. When the annihilation of the waste lubricates by burning is taken into consideration, the plants which took license according to Article 22 and Article 23 of the Regulations of Control of Dangerous Wastes will be used.

Annihilation of the packages: It should be assessed under the wastes annihilation.
Industrial waste EU number: 13-01-06 (hydraulic lubricants containing only mineral lubricant)
Local responsibilities: dated 27.08.1995 and numbered 22387 Official Gazette, Regulations of Control of Dangerous Wastes.

CHAPTER 11 – DISMANTLING / DECOMMISSIONING THE MACHINE

For the machines which have completed its operating life, in the decommissioning process;

- Bring the upper table of the machine to the lowest position.
- After completely emptying the hydraulic lubricant in the machine, annihilate this lubricant according to the rules of the environment protection laws.
- Unfix the bolts of the machine which fixes the machine to the ground.
- Machine components can be classified as follows;
  - Electronic wastes (sensors, light curtains…)
  - Steel recycle
  - Aluminum
  - Materials except iron (felts, motor propellers, sledge ulpolens…)